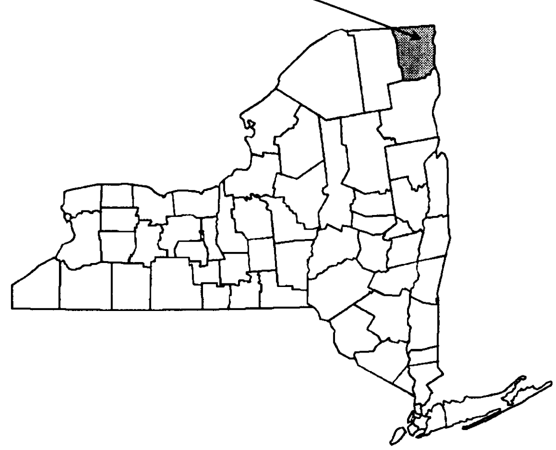
FLOOD INSURANCE STUDY

CLINTON COUNTY, NEW YORK
(ALL JURIDICTIONS)



COMMUNITY NAME	COMMUNITY NUMBER
ALTONA, TOWN OF	361379
AUSABLE, TOWN OF	360165
BEEKMANTOWN, TOWN OF	360166
BLACK BROOK, TOWN OF	361309
CHAMPLAIN, TOWN OF	361311
CHAMPLAIN, VILLAGE OF	360167
CHAZY, TOWN OF	361310
CLINTON, TOWN OF	361380
ELLENBURG, TOWN OF	361382
KEESEVILLE, VILLAGE OF	360266
MOOERS, TOWN OF	361383
PERU, TOWN OF	361384
PLATTSBURGH, CITY OF	360168
PLATTSBURGH, TOWN OF	360169
ROUSES POINT, VILLAGE OF	360170
SARANAC, TOWN OF	360171
SCHUYLER FALLS, TOWN OF	360172

SEPTEMBER 28, 2007

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
36019CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Countywide FIS Effective Date: September 28, 2007

Revised Countywide FIS Date:

TABLE OF CONTENTS

TABLE OF CONTENTS – continued

FLOOD INSURANCE STUDY
CLINTON COUNTY, NEW YORK (ALL JURISDICTIONS)

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) investigates the existence and severity of flood hazards in, or revises and updates previous FISs/Flood Insurance Rate Maps (FIRMs) for the geographic area of Clinton County, New York, including the City of Plattsburgh, the Towns of Altona, AuSable, Beekmantown, Black Brook, Champlain, Chazy, Clinton, Dannemora, Ellenburg, Mooers, Peru, Plattsburgh, Saranac, Schuyler Falls, and the Villages of Champlain, Dannemora, Keeseville, and Rouses Point (hereinafter referred to collectively as Clinton County). The Town of Dannemora and the Village of Dannemora are non-flood prone communities.

The Village of Keeseville is located within both Clinton County and Essex County, New York, but is included in its entirety in the Clinton County, New York (All Jurisdictions) FIS.

This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information will also be used by Clinton County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This FIS was prepared to include all jurisdictions within Clinton County in a countywide format. Information on the authority and acknowledgments for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below.

Beekmantown, Town of:	the hydrologic and hydraulic analyses for the FIS report dated May 4, 1987, were taken from the

	March 1979 FIS for the Town of Plattsburgh. That work was performed by Camp, Dresser, and McKee, Environmental Engineers for the Federal Insurance Administration (FIA), under Contract No. H-3832. That work was completed in November 1977.
Black Brook, Town of	the hydrologic analyses for the FIS report dated February 15, 1983, were prepared by the U.S. Army Corps of Engineers (USACE), New York District. The hydraulic analyses were performed by McFarland-Johnson Engineers for the USACE, New York District. That work was completed in January 1981.
Champlain, Town of	the hydrologic and hydraulic analyses for the original September 4, 1987, FIS, were taken from the March 1979 FIS for the Town of Plattsburgh. That work was performed by Camp, Dresser, and McKee, Environmental Engineers, for the FIA, under Contract Number H-3832 and was completed in November 1977. For the July 19, 2001, FIS report, the hydrologic and hydraulic analyses were prepared by Leonard Jackson Associates for the Federal Emergency Management Agency (FEMA), under Contract Number EMW 95-C-4692. This work was completed in August 1997
Champlain, Village of:	the hydrologic and hydraulic analyses for the FIRM dated July 19, 2001, were prepared by Leonard Jackson Associates for FEMA under Contract Number 95-C-4692. This work was completed in August 1997.
Chazy, Town of:	the hydrologic and hydraulic analyses for the FIS report dated May 19, 1987, were taken from the March 1979 FIS for the Town of Plattsburgh. That work was performed by Camp, Dresser, and McKee, Environmental Engineers for the FIA, under Contract No. H-3832 and was completed in November 1977.
Peru, Town of	the hydrologic and hydraulic analyses, for the original May 4, 1987, FIS were taken from the March 1979 FIS for the Town of Plattsburgh. That work was performed by Camp, Dresser, and McKee, Environmental Engineers for the FIA,

under Contract No. H-3832 and was completed in November 1977.

For the October 20, 2000, FIS report, the hydrologic and hydraulic analyses were prepared by Kozma Associates Consulting Engineers, P.C., for FEMA under Contract No. EMW-94-C-4379. This work was completed in July 1995.

Plattsburgh, City of	the hydrologic and hydraulic analyses for the original October 1977 FIS report were prepared by Camp, Dresser, and McKee, Environmental Engineers, for the FIA, under Contract No. H-3832. That work was completed in November 1976. For the June 3, 2003, FIS report, the hydrologic and hydraulic analyses for Saranac River were prepared by Kozma/Medina Joint Venture, Inc., for FEMA, under Contract No. EMW-1999-CO-0390. This work was completed in May 2001.
Plattsburgh, Town of:	the hydrologic and hydraulic analyses for the original FIS dated March 1979 were performed by Camp, Dresser, and McKee, Environmental Engineers for the FIA, under Contract No. H-3832. That work was completed in November 1977. For the June 3, 2003, FIS report, the hydrologic and hydraulic analyses for Saranac River were prepared by Kozma/Medina Joint Venture, Inc., for FEMA, under Contract No. EMW-1999-CO-0390. This work was completed in September 2001.
Rouses Point, Village of	the hydrologic and hydraulic analyses for the FIS report dated August 4, 1987, were taken from the March 1979 FIS for the Town of Plattsburgh. That work was performed by Camp, Dresser, & McKee, Environmental Engineers for the FIA, under Contract No. H-3832 and was completed in November 1977.
Saranac, Town of	For the original March 3, 1992, FIS report, the hydrologic and hydraulic analyses were prepared by Leonard Jackson Associates for FEMA, under Contract No. EMW-89-C-2822. That work was completed in September 1990.

	For the July 2, 2003, FIS report, the hydrologic and hydraulic analyses for Saranac River were prepared by the Kozma/Medina Joint Venture for FEMA, under Contract No. EMW-1999-CO-0390. This work was completed in October 2001.
Schuyler Falls, Town of	For the original September 30, 1992, FIS, the hydrologic and hydraulic analyses for the Salmon River, were prepared by Leonard Jackson Associates for FEMA, under Contract No. EMW-89-C-2822. That work was completed in September 1990. For the May 17, 2004, FIS report, the hydrologic and hydraulic analyses for the Saranac River were prepared by Kozma/Medina Joint Venture, for FEMA, under Contract No. EMW-1999-CO-0390. This work was completed in September 2001.

The authority and acknowledgments for the Towns of Altona, AuSable, Clinton, Dannemora, Ellenburg, and Mooers and the Villages of Dannemora and Keeseville are not available because no FIS reports were published for these communities.

Due to the incorporation of the Village of Mooers into the Town of Mooers, the effective flood hazard information previously shown on the Village of Mooers FIRM dated January 17, 1986 is now located within the Town of Mooers.

For this countywide FIS, updated hydrologic and hydraulic analyses were performed for the Saranac River, from a point approximately 5.9 miles downstream of Silver Lake Road, to a point approximately 170 feet upstream of Union Falls Road. These analyses were prepared by Kozma/Medina Joint Venture for FEMA, under Contract No. EMW-1999-C-0390. This work was completed in October 2001.

This countywide FIS also incorporates existing detailed data for the AuSable River, from approximately 2.2 miles upstream of Lower Road to the confluence with the East and West Branches of the AuSable River. These data were prepared for the FIS for the Town of Jay in Essex County, New York by Kozma/Medina Joint Venture for FEMA, under Contract No. EMN-98-CO-0013. This work was completed in October 1999. In addition, detailed information for the Salmon River was extended from the Town of Schuyler Falls into the Town of Peru.

A base flood elevation and supporting data were provided by the New York Department of Environmental Conservation (NYSDEC) for Fern Lake in the Town of Black Brook.

In addition to the aforementioned changes, floodplains for the following flooding sources have been redelineated using updated topographic data provided by NYSDEC, as part of this revision: AuSable River, Black Brook, Dry Mill Creek and tributaries, Fern Lake, Taylor Pond, Unnamed Tributary to AuSable River, and West Branch AuSable River. Also, the floodplain in the vicinity of Scomotion Creek in the City of Plattsburgh has been adjusted to reflect updated topographic data submitted by the City of Plattsburgh Building and Zoning Department (AED Associates, 1987 and H. Paul Development/J. D. Dame Contracting, 1984).

Minor adjustments were made to the flood elevation boundaries along community boundaries in order to produce a seamless FIRM for the entire county.

An area of Zone A was added to the Town of Black Brook along Cold Brook to tie-in flooding from the Town of Saranac.

The projection used in the preparation of this FIRM was Universal Transverse Mercator (UTM) Zone 18. The horizontal datum was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Base map information shown on this FIRM was derived from digital orthophotography provided by the New York State Office of Cyber Security & Critical Infrastructure Coordination. This information was produced as 30-centimeter resolution natural color and 60-centimeter resolution color infrared orthoimagery from photography dated April-May 2003.

1.3 Coordination

Consultation Coordination Officer's (CCO) meetings may be held for each jurisdiction in this countywide FIS. An initial CCO meeting is held typically with representatives of FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods. A final CCO meeting is held typically with representatives of FEMA, the community, and the study contractor to review the results of the study.

The dates of the initial and final CCO meetings held for the incorporated communities within Clinton County are shown in Table 1, "Initial and Final CCO Meetings."

TABLE 1 - INITIAL AND FINAL CCO MEETINGS

Community	FIS Date	Initial CCO Date	Final CCO Date
Beekmantown, Town of	May 4, 1987	*	June 9, 1986
Black Brook, Town of	February 15, 1983	*	October 5, 1982
Champlain, Town of	September 4, 1987 July 19, 2001	* August 8, 1997[1]	June 10, 1986 June 5, 2000
Champlain, Village of	July 19, 2001 (FIRM)	*	June 6, 2000
Chazy, Town of	May 19, 1987	*	June 9, 1986
Peru, Town of	May 4, 1987 October 20, 2000	* April 2, 1992	June 11, 1986 June 22, 1999
Plattsburgh, City of	October 1977 June 3, 2003	August 18, 1975 September 28, 2001[1]	December 21, 1976 May 23, 2002
Plattsburgh, Town of	March 1979 June 3, 2003	August 18, 1975 September 28, 2001[1]	October 16, 1978 May 23, 2002
Rouses Point, Village of	August 4, 1987	*	June 10, 1986
Saranac, Town of	March 3, 1992 July 2, 2003	September 1998 March 14, 2002[1]	* July 11, 2002
Schuyler Falls, Town of	September 30, 1992 May 17, 2004	March 1988 October 31, 2002[1]	August 15, 1991 April 8, 2003

[1]Notified by letter
*Data not available

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Clinton County, New York.

All or portions of the flooding sources listed in Table 2, "Flooding Sources Studied by Detailed Methods," were studied by detailed methods. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

TABLE 2 - FLOODING SOURCES STUDIED BY DETAILED METHODS

AuSable River	Salmon River
Button Brook	Saranac River
Great Chazy River	Silver Stream
Lake Champlain	West Branch AuSable River
Little AuSable River	

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

All or portions of numerous flooding sources in the county were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA, the local communities, and Clinton County.

2.2 Community Description

Clinton County is located in northeastern New York, to the west of Vermont, and to the south of the Canadian province of Quebec. Essex County, New York lies to the south of the county and Franklin County to the west. Adirondack State Park is located in the southwestern part of Clinton County.

Clinton County was founded in 1788, and is named after George Clinton, the first governor of the State of New York. Its county seat is the City of Plattsburgh. The county encompasses approximately 1,118 square miles. According to the U.S. Census Bureau, the population in 2000 was 79,894, a decrease of 7.1% from 1990.

The climate of the region consists of cold winters and short, moderately warm humid summers. The mean maximum temperature in January is 27 degrees Fahrenheit (°F) and the mean maximum temperature in July is 77°F. The mean precipitation accumulation in July is 3.1 inches; the mean snowfall accumulation in January is 16 inches (Weatherbase.com, 2005).

The area has a variety of land types and significant climate differences associated with these land types. Glacial till and clay soils, underlain by sedimentary rocks, are predominant in Clinton County. The eastern section is slightly hilly, whereas the western section is mostly mountainous terrain. As a result of this difference in terrain, the western section of the county tends to be cooler.

Lake Champlain is a glacial lake with a north-south orientation forming the border between New York and Vermont. Its total length is over 100 miles. At its widest point, between the City of Port Kent, New York, and Burlington, Vermont, the lake is approximately 12 miles wide. At the Canadian border, where the lake empties into the Richelieu River, its drainage area is 8,277 miles.

The AuSable River flows easterly into Lake Champlain and has a drainage area of approximately 516.4 square miles at the crossing of the Delaware and Hudson Railroad. The Little AuSable River also flows easterly into Lake Champlain and has a drainage area at its mouth of approximately 73.4 square miles. The AuSable River watershed lies entirely within the boundaries of Adirondack State Park. The West Branch AuSable River is formed on the north slope of Mt. Marcy and flows generally north to AuSable Forks, where it joins with the East Branch AuSable River to form the main stem.

Silver Stream also is an easterly flowing tributary of Lake Champlain and has a drainage area of approximately 6.1 square miles at its mouth. Button Brook, a tributary of the Little AuSable River, flows easterly and has a drainage area of approximately 5.9 square miles at its mouth.

The Saranac River watershed extends to neighboring Franklin County to the west and Essex County to the south. The Saranac River flows generally northeasterly and easterly through Clinton County to its mouth at the western shore of Lake Champlain. The drainage area of the Saranac River is 608 square miles at the USGS Gaging Station (No. 04273500) in the City of Plattsburgh, approximately 3.2 miles upstream from Lake Champlain.

Scomotion Creek, at times referred to as Dead Creek, originates in a swampy area in the Town of Beekmantown at the confluence of Allen and Ray Brooks, flowing south into the Town of Plattsburgh before it turns to the east and empties into Lake Champlain in the northern part of the City of Plattsburgh, near Margaret Street. It drains approximately 44 square miles. The creek is very flat and is bordered on both sides by a forested swamp which extends in places up to 1,500 feet from the creek.

The Salmon River originates at the base of Little Ellis and Columbe Mountains in the Adirondack State Park in Black Brook, New York, and flows east between Burnt Hill and Terry Mountain in the Clinton State Forest in Peru, New York, to Schuyler Falls, South Plattsburgh, and South Junction, where it empties into Lake Champlain at the corporate boundary between the Towns of Plattsburgh and Peru. The river falls about 1,080 feet in its 20-mile course and drains an area of 66 square miles.

Mead Reservoir, which drains an area of 6.8 square miles and is fed by Beartown and West Brooks, flows south from Beekmantown. The reservoir discharges into Mead Brook, which flows south to Scribner Pond in West Plattsburgh and thence southeasterly to its confluence with the Saranac River downstream of Morrisonville.

Patterson Reservoir (also West Brook Reservoir), drains an area of 6.6 square miles and is fed by Sandburn Brook, which flows south from Beekmantown. The reservoir discharges into Patterson Brook, which flows east along State Route 3 to its confluence with Mead Brook just upstream of Scribner Pond.

2.3 Principal Flood Problems

Flooding can occur in any month of the year in Clinton County. However, the majority of the larger floods have occurred in late winter and early spring and have resulted from ice jams and ice melt. Particularly, this has been the case since 1970, as the area experienced three significant ice jam flood events and only one minor flood where ice was not a factor.

Major floods along the AuSable River occurred in January 1919, October 1924, March 1936, September 1938, and February 1976. The estimated discharge for the AuSable River in September 1938 was 24,200 cubic feet per second (cfs) (USACE, Review of Report). In February 1976, the area experienced a major flood caused by ice freezing to the bottom of the channel, forming a jam. The jam backed up and collected enough ice to completely fill the channel from bank to bank upstream of the initial jam. With the channel blocked, the AuSable River diverted to alternate paths along the overbanks and flowed through the streets, residences, and businesses on either side of the river. The jam remained in place for approximately three weeks (USACE, 1978).

High-water levels on Lake Champlain result from a complex combination of climatic conditions that characterize the winter period throughout its drainage area. The conditions most conducive to flooding along the lake shore are freezing temperatures and a large quantity of snowfall throughout the winter, followed by a sudden period of warm and rainy weather without a refreeze. Such a combination has occurred in varying intensities in the past and has resulted in flood damage along the shore. To aggravate this flooding, the ice sheet on the lake's surface has been so thick at times that it did not readily melt with the onset of warm weather. The result has been that the large volume of water in the lake has lifted the ice, and strong winds have forced it ashore, crushing lake front structures in its path.

High lake levels are of concern because of the proximity of residential dwellings, streets and highways, and railroad lines to the lake shore. When the lake level reaches 100 feet, property damage becomes likely, especially if winds are prevalent. As noted above, the existence of ice blocks under conditions of wind and high water can further exacerbate the threat to property (Manley, 1999).

The maximum known lake level occurred on May 4, 1869 (101.8 North American Vertical Datum [NAVD]). While this level predates the Rouses Point gaging station, it is considered reliable. Other notable floods occurred in April 1903, when the lake stage reached an elevation of 101.5 feet NAVD, March 1936 (101.31 feet NAVD) and April 1976 (101.34 feet NAVD). Two more recent events provide the second and third highest lake levels of record. On April 27, 1993, Lake Champlain reached a level of 101.6 feet NAVD at Rouses Point, New York. A major factor in that high level was the unusually large areal extent and depth of the snow pack in the basin. On April 5, 1998, the high water level in Lake Champlain reached 101.5 feet NAVD. For that event, the starting lake level was higher than 1993 due to a severe ice storm in early January, which fell as rain in much of the basin. The actual lake level peak was caused by a single event at the end of March, a thermal melt from 3 days of record-setting warm temperatures over the totally snow-covered basin (Manley, 1999).

Local residents have reported that waves as high as eight feet have been encountered on Lake Champlain and, at times, six-foot waves break against the cliffs in the vicinity of Plattsburgh.

On April 8, 1928, flooding occurred along the Saranac River causing property damage in the Town of Plattsburgh. Flooding at the Fredenburgh power house forced the shutdown of the Saranac Pulp and Paper Company, the town's source of electricity. The water was 52 inches deep on the spillway of Treadwell Mills Dam, even though the five 6-foot by 5-foot and seven 6-foot by 8-foot gates at the dam were open to pass water. The Purdy Dam at Morrisonville was threatened with collapse, and several "standards of logs" behind the dam were lost (Daily Republican, 1928). Water at the Kents Falls spillway was about 6 inches deep on the side abutments which were about 5.8 feet above the spillway.

An even larger flood occurred on the Saranac River in March 1936, although there were no measuring devices along the river at the time to record the discharge. With the collapse of the Purdy Dam, 3 feet of water flowed down Main Street in Morrisonville. After the river receded, huge ice blocks were strewn about the street and along properties (Daily Republican, March 19, 1936). The road between Cadyville and Saranac was flooded with 8 inches of water, because of an ice jam at the mill pond above Cadyville (Daily Republican, March 20, 1936).

Flooding also occurred along the Saranac River due to ice jams in 1971 and 1976 in the vicinity of Morrisonville.

The flood of record of the Saranac River occurred on November 9, 1996, when the maximum discharge measured at the U.S. Geological Survey (USGS) Stream Flow Gage (No. 04273500) was 14,400 cubic feet per second (cfs). On April 1, 1998, and on December 30, 1984, discharges of 11,200 cfs and 10,100 cfs, respectively, were measured at the same gaging station.

The swamp along Scomotion Creek floods every year that the lake level, which is normally 95 feet, rises to approximately 98 feet. In March 1936, the portion of U.S. Route 9 lying north of the creek was under more than a foot of water, but this road has since been raised (Daily Republican; March 23, 1936).

The Salmon River and Mead and Patterson Brooks and their reservoirs present almost no flood threat at all because their banks are mostly undeveloped. In April 1937, the Salmon River flooded several hundred acres of low-lying farm land between Schuyler Falls and South Plattsburgh (Daily Republican; April 7, 1937). Mead Brook flowed 1.5 feet deep on the Cadyville Highway (Route 3) in April 1928 (Daily Republican, April 9, 1928).

2.4 Flood Protection Measures

There are no known structural flood control measures in existence within the county.

Non-structural measures of flood protection are being utilized to aid in the prevention of future flood damage. These measures are in the form of land use regulations which control building within areas that have a high risk of flooding.

In past instances, the USACE has been called in to attempt to break up the ice jams. More recently, the Towns of Plattsburgh and Schuyler Falls have used dynamite to break ice jams to allow the Saranac River to flow freely before causing damage.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this FIS. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the county at the time of completion of this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for the flooding sources studied in detail affecting the county.

Precountywide Analyses

Each incorporated community within Clinton County with the exception of the Towns of Altona, AuSable, Clinton, Ellenburg, Mooers, and the Villages of Champlain and Keeseville, has a previously printed FIS report. The hydrologic analyses described in those reports have been compiled and are summarized below.

A summary of the drainage area-peak discharge relationships for all the streams studied by detailed methods is shown in Table 3 "Summary of Discharges."

TABLE 3- SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs)			
		10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
AUSABLE RIVER					
At crossing of Delaware and Hudson Railroad	516.4	16,200	22,500	25,400	32,700
At the downstream corporate limit for the Town of Jay	448.0	15,890	22,110	25,060	32,350
BUTTON BROOK					
At confluence with Little AuSable River	5.9	310	440	490	620
Upstream of Jarvis Road	5.3	280	400	440	560
GREAT CHAZY RIVER					
At confluence with Lake Champlain	312	5,790	7,510	8,210	9,880
Upstream of confluence with Corbeau Creek	272	5,310	6,840	7,480	8,970
At upstream corporate limits of the Village of Champlain	263	5,260	6,750	7,370	8,820
LITTLE AUSABLE RIVER					
At confluence with Lake Champlain	73.4	2,110	2,920	3,270	4,130
Upstream of confluence of Campground Brook	70.2	1,970	2,720	3,040	3,830
Upstream of confluence of Arnold Brook	56.9	1,580	2,160	2,400	3,010
Upstream of confluence of Button Brook	51.0	1,410	1,930	2,140	2,670
SALMON RIVER					
At downstream corporate Limit for Town of Schuyler Falls	61.9	*	*	2,210	*
Above confluence of Riley Brook	39.8	*	*	1,590	*

*Data not available

TABLE 3- SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
SARANAC RIVER					
At USGS Gaging Station No. 04273500	608.0	8,550	11,200	12,300	14,300
Upstream from the confluence with Mead Brook	581.0	7,570	9,860	10,820	13,010
Downstream from the confluence of Canfield Brook	581.0	7,570	9,860	10,820	13,010
Upstream from the confluence of Canfield Brook	562.0	7,600	9,840	10,790	12,920
Upstream from the confluence of Behan Brook	535.3	6,610	8,540	9,360	11,200
Upstream from the confluence of True Brook	494.7	6,140	7,900	8,620	10,270
Upstream from the confluence of North Branch Saranac River	353.9	4,180	5,290	5,730	6,770
SILVER STREAM					
At confluence with Lake Champlain	6.1	310	460	530	690
Approximately 1,500 feet downstream of Nelson Road	3.4	190	270	310	400
Approximately 2,200 feet upstream of Nelson Road	0.9	70	100	120	150
WEST BRANCH AUSABLE RIVER					
At the confluence with the AuSable River	233	8,100	12,000	14,000	19,700

For Lake Champlain, the USGS measures lake stages at two gaging stations on the northern end of Lake Champlain. Both stations are equipped with continuous recording devices. One station (No. 04294500) is at Burlington, Vermont. The second station (No. 04295000) is at Rouses Point, New York, on the western shore of the lake about 20 miles north-northeast of Plattsburgh. The data from the Rouses Point gage were used for this analysis for the following reasons: it is located on the western shore of Lake Champlain, its period of record (1871 to present) is longer than that of the Burlington gage, and because examination of the records of these gages shows that the lake stages at both locations are very similar.

Graphical frequency analysis for Lake Champlain was chosen as the method most likely to determine lake stages with a reasonable degree of accuracy. The results of this analysis were plotted on an arithmetic-probability graph (rather than a logarithmic-probability graph) which allows data points to vary over a wider range. This flexibility helps to describe a stage-frequency curve more accurately and reduces the human error introduced in fitting a curve through plotted points. It was decided not to employ the log-Pearson Type III frequency analysis because the range of logarithms of the lake stage data is too narrow to yield reliable results.

Three graphical frequency analyses were applied to the data measured at the Rouses Point (Fort Montgomery) gage from 1869 to 1976. They were the Weibull and Hazen Formulas (V. T. Chow, 1964) and the Beard Method (USACE, 1962). Stages determined for Lake Champlain and presented in this report were obtained from the stage-frequency curve produced by the Beard Method, because this curve appears to be an average of the curves produced by the other two formulas. The results of this graphical frequency analysis are shown in Table 4, "Summary of Stillwater Elevations."

The stillwater elevations have been determined for the 10-, 2-, 1-, and 0.2-percent annual chance floods for the flooding sources studied by detailed methods and are summarized in Table 4, "Summary of Stillwater Elevations."

TABLE 4 - SUMMARY OF STILLWATER ELEVATIONS

	ELEVATION (feet NAVD[1])			
FLOODING SOURCE AND LOCATION	10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
LAKE CHAMPLAIN	100.7	101.5	101.7	102.0

[1]North American Vertical Datum of 1988

The statistical analysis of the stages of Lake Champlain should be applied only to data collected since October 1938, when a continuous recording device was installed.

For the portion of AuSable River within the Town of Peru, the Little AuSable River, Silver Stream, Button Brook, and the Saranac River (within the City of Plattsburgh, and Towns of Plattsburgh and Saranac) the peak discharges of the selected recurrence intervals were determined using the procedures and regression equations developed by the USGS and the Water Resources Council (Water Resources Council, 1976; Water Resources Council, 1977; U.S. Department of the Interior, 1991). For Hydrologic Region No. 2 of New York State, the following equation was used:

$$Q = K(DA)^{v}(SL)^{w}(ST + 1)^{x}(P - 20)^{y}(EL)^{z}$$

where Q is the stream discharge; DA is the drainage area in square miles; SL is the main channel slope in feet per mile; ST is the basin storage in percent of the total basin drainage area; P is the mean annual precipitation in inches; EL is the average main channel elevation in feet; and K, v, w, x, y, and z are functions of the frequency. The values used for K, v, w, x, y, and z are shown in the following tabulation:

FREQUENCY	K	v	w	x	y	z
10-year	9.77	0.891	0.251	-0.209	1.019	-0.273
50-year	16.30	0.887	0.236	-0.256	1.066	-0.302
100-year	19.10	0.887	0.230	-0.275	1.086	-0.311
500-year	25.60	0.889	0.218	-0.318	1.134	-0.327

The peak discharges of the AuSable and Saranac Rivers as calculated by the above regression equations and those estimated as weighted peak discharges for the USGS Gaging Station No. 04275500 near AuSable Forks, New York (for AuSable River) and USGS Gaging Station No. 04273500 at Plattsburgh, New York (for Saranac River), were used to adjust the peak discharges calculated by the regression equations at ungaged sites in accordance with the following equation:

$$Q_{T(wu)} = \frac{Q_{T(w)}}{Q_{T(r)}} - [\frac{2(|A_g - A_u|)}{A_g}]x(\frac{Q_{T(w)}}{Q_{T(r)}} - 1)Q_{T(ru)}$$

where $Q_{T(wu)}$ is the weighted peak-discharge estimate for the ungaged site; $Q_{T(w)}$ is the weighted peak-discharge estimate for the gaged site; $Q_{T(ru)}$ is the regression peak-discharge estimate for the ungaged site; $Q_{T(r)}$ is the regression peak-discharge estimate for the gaged site; A_u is the drainage area of the ungaged site; and A_g is the drainage area of the gaged site.

The hydrology for West Branch AuSable River was analyzed by estimating its contribution based on the relative timing of the East and West Branches using unit hydrograph methods.

The hydrology for the Great Chazy River was prepared using data from USGS gaging station No. 04271500 at Perry Mills (Geomaps, 1996). Using the gage data, correction factors were determined. The correction factors were incorporated into regression equations to produce weighted peak discharges. Equations used to determine correction factors relates gaged sites to ungaged sites by manipulating the different drainage areas. Regression equations relate the regional drainage area, average channel slope, storage, precipitation and elevation to determine a regression peak flow.

Flood-frequency discharge values for Scomotion Creek were determined using comparison flows. There is no gaging station on Scomotion Creek; as a result, flow in the creek had to be estimated by comparison with flows measured in other waterways in the region. Unfortunately, all waterways in this region whose flows are measured are mountain streams which convey more water and have less storage areas than does Scomotion Creek. Use of regionalized hydrologic data for developing flows in Scomotion Creek, therefore, is highly questionable. There is, however, no other data available for use in this case, but as will be explained below, the unreliability of flows developed for this creek is inconsequential.

The method employed in developing flows in Scomotion Creek was a regional method developed for New York streams by F. L. Robinson (U.S. Department of Interior, 1961). He states that "most of the unregulated Adirondack streams, although affected by considerable spring snowmelt, do not produce high mean annual floods, probably due to the effect of storage in lakes and swamps." It is expected that this damping effect of storage is even more pronounced in flows developed for Scomotion Creek, whose drainage area is very flat and swampy, than in those developed for waterways whose flows were measured and used in developing the Robinson method.

The hydrologic analysis for the portion of the Salmon River within the Town of Schuyler Falls was prepared using transposed gage data. A log-Pearson Type III flood frequency analysis was performed on data from the USGS Gage No. 04273700 at South Plattsburgh, New York, to compute peak discharges for the selected recurrence intervals. These peak discharges were then transposed downstream using the ratio of the drainage raised to 0.75 power.

For the portion of the Salmon River within the Towns of Peru and Plattsburgh, the 1-percent annual chance discharge, which was studied by approximate analyses, was obtained from a log-Pearson Type III Analysis of 17 peak discharges recorded at USGS Gage No. 04273700 on the Salmon River at Salmon River Road in South Plattsburgh (Water Resources Council, 1976). This was a seasonal recording gage between 1960 and 1968. Recorded stages have not been corrected for the effects of ice, if any, in the river. The 1-percent annual chance discharge of 2,250 cfs at this gage, with a drainage area of 61.9 square miles, is an approximate calculation.

The spillway discharges of Mead and Patterson reservoirs were determined from an approximate procedure based on Technical Release No. 55 of the SCS and the Modified Puls routing method (U.S. Department of Agriculture, 1975; V. T. Chow, 1964). The 1-percent annual chance spillway discharge at the Mead Reservoir is 240 cfs. The 1-percent annual chance flood spillway discharges at the Upper and Lower Patterson reservoirs are 384 cfs and 25 cfs, respectively. The 1-percent annual chance discharges at several points along Mead and Patterson Brooks consist of reductions of the Salmon River discharge (based on cfs per square mile of drainage area) added to spillway discharges from the reservoirs.

Revised Analyses for Countywide FIS

For the Saranac River (within the Town of Black Brook) and AuSable River (within the Towns of AuSable and Black Brook), the peak discharges of the selected recurrence intervals were determined using the procedures and regression equations developed by the USGS and the Water Resources Council (Water Resources Council, 1977; U.S. Department of the Interior, 1991). For Hydrologic Region No. 2 of New York State, the following equation was used:

$$Q = K(DA)^{v}(SL)^{w}(ST + 1)^{x}(P - 20)^{y}(EL)^{z}$$

where Q is the stream discharge; DA is the drainage area in square miles; SL is the main channel slope in feet per mile; ST is the basin storage in percent of the total basin drainage area; P is the mean annual precipitation in inches; EL is the average main channel elevation in feet; and K, v, w, x, y, and z are functions of the frequency. The values used for K, v, w, x, y, and z are shown in the following tabulation:

FREQUENCY	K	v	w	x	y	z
10-year	9.77	0.891	0.251	-0.209	1.019	-0.273
50-year	16.30	0.887	0.236	-0.256	1.066	-0.302
100-year	19.10	0.887	0.230	-0.275	1.086	-0.311
500-year	25.60	0.889	0.218	-0.318	1.134	-0.327

The peak discharges for the Saranac River and AuSable River as calculated by the above regression equations and those estimated as weighted peak discharges for USGS Gaging Station No. 04273500 at Plattsburgh, New York (for the Saranac River), and USGS Gaging Station Numbers 04275300 and 04225000 near Au Sable Forks, New York, (for the AuSable River), were used to adjust the peak discharges calculated by the regression equations at ungaged sites in accordance with the following equation:

$$Q_{T(wu)} = \frac{Q_{T(w)}}{Q_{T(r)}} - [\frac{2(|A_g - A_u|)}{A_g}]x(\frac{Q_{T(w)}}{Q_{T(r)}} - 1)Q_{T(ru)}$$

where $Q_{T(wu)}$ is the weighted peak-discharge estimate for the ungaged site; $Q_{T(w)}$ is the weighted peak-discharge estimate for the gaged site; $Q_{T(ru)}$ is the regression peak-discharge estimate for the ungaged site; $Q_{T(r)}$ is the regression peak-discharge estimate for the gaged site; A_u is the drainage area of the ungaged site; and A_g is the drainage area of the gaged site.

The hydrologic analysis for the portion of the Salmon River within the Town of Peru was prepared using transposed gage data. A log-Pearson Type III flood frequency analysis was performed on data from the USGS Gage No. 04273700 at South Plattsburgh, New York, to compute peak discharges for the selected recurrence intervals. These peak discharges were then transposed downstream using the ratio of the drainage raised to 0.75 power.

The spillway discharge of Fern Lake was based on the regression formula from the USGS publication WRI 79-83. The 1-percent annual chance spillway discharge is 680 cfs. Hydraulic calculations show that the dam will be overtopped by 1.5 feet or 2.5 feet above the spillway crest, resulting in the base flood elevation of 1225.2 NAVD 88.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the source studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Precountywide Analyses

Each incorporated community within Clinton County, with the exceptions of the Towns of Altona, AuSable, Clinton, Ellenburg, Mooers, and the Villages of Champlain and Keeseville, has a previously printed FIS report. The hydraulic analyses described in those reports have been compiled and are summarized below.

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

For the AuSable River, West Branch AuSable River, Button Brook, Great Chazy River, Salmon River, Saranac River, and Silver Stream, water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (USACE, 1991). This computer model was calibrated using historic floodwater profiles.

Starting water-surface elevations for the AuSable River, Button Brook, Little AuSable River, Salmon River, Saranac River, and Silver Stream were determined using the slope/area method. To obtain starting water-surface elevations for the West Branch AuSable River, a rating curve was plotted at the confluence using the discharges and the computed elevations of the AuSable River. Starting water-surface elevations were obtained from this curve using coincidental discharges at the confluence with the AuSable River. The starting water-surface elevations for the Great Chazy River were obtained from a previous FEMA study for Lake Champlain.

In analyzing flooding from Lake Champlain, special consideration was given to the vulnerability of the Plattsburgh lake shore to wave attack during severe storms, when the lake stage is high. As stated above, the Plattsburgh shore has suffered damages in the past because of wave action.

The USACE has developed methods (USACE; Vol. I, 1973; Vol. II, 1973; and 1975) to determine which sections of a coastline are subject to wave action. The factors considered for such a determination include choice of a suitable fetch, its length and width, sustained wind velocities, coastal water depths, and physical features of the coastline which could appreciably affect wave propagation. All of these factors are analyzed to find out whether a critical breaking wave with a height of at least three feet can be generated; this has been selected by the USACE as the minimum height of a wave capable of causing major damage upon impact to a conventional wood or brick veneer frame structure. Data from Lake Champlain survey charts published by the National Oceanic and Atmospheric Administration (U.S. Department of Commerce, 1974) and determinations of wave run-up on the Great Lakes (U.S. Department of the Interior, 1976) were also used in the analysis.

Lake stages and discharges of various recurrence intervals ranging from five to 100 years from Lake Champlain were used as starting conditions for step-backwater computations along Scomotion Creek. Stages and discharges were combined to result in a joint recurrence frequency of 100 years. This method of developing a joint frequency is valid only for events which are independent of each other; the lake stage and flow in the creek are not independent of one another, but are somewhat dependent on the same climatological conditions. Nevertheless, this method of joint frequency was used to approximate the water-surface profile to be expected in Scomotion Creek. In each case, the 1-percent annual chance profile, the resulting 1-percent annual chance profile is even further below the 1-percent annual chance lake stage than are profiles computed using the joint frequency method which assumes independence of events.

It was concluded that, at times of high water, Lake Champlain inundates Scomotion Creek so that the creek's water-surface elevation was the same as that in the lake. This conclusion was confirmed on June 10, 1976, when it was observed that the flow of water was from the lake into the creek. At that time, the lake stage was 98.1 feet NAVD, a stage whose frequency-of-occurrence was, on the average, once in 14.5 months. Accordingly, no profile showing flood elevations for Scomotion Creek has been created. The extent of the 1-percent annual chance and 0.2-percent annual chance flood is delineated on the maps.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the streams and floodplain areas. Roughness factors for all streams studied by detailed methods are shown in Table 5, "Manning's "n" Values."

Cross-section data for the AuSable River, Button Brook, Little AuSable River, and Silver Stream were obtained from aerial photography at a scale of 1:14,400 that was used to produce topographic mapping at a scale of 1:4,800, with a 4-foot contour interval (MS Technologies, Inc. 1993). Cross-section data for the backwater analysis on the Great Chazy River were obtained from aerial photographs (Geomaps, Inc., 1996). Cross sections along the Saranac River were obtained from aerial photography used to produce topographic maps at a scale of 1:4,800, with a 4-foot contour interval (Phillips & Associates, 1998). Cross sections for the Salmon River were obtained from field measurements.

All below-water sections were obtained by field measurements. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

TABLE 5 - MANNING'S "n" VALUES

Stream	Channel "n"	Overbank "n"
AuSable River	0.035 – 0.045	0.050 – 0.100
Button Brook	0.030 – 0.035	0.070 – 0.090
Great Chazy River	0.025 – 0.030	0.800
Little AuSable River	0.030 – 0.040	0.060 – 0.095
Mead Brook	0.020 – 0.050	0.050 – 0.100
Patterson Brook	0.020 – 0.060	0.050 – 0.100
Salmon River	0.035 – 0.050	0.050 – 0.120
Saranac River	0.030 – 0.050	0.055 – 0.090
Silver Stream	0.030 – 0.035	0.070 – 0.090
West Branch AuSable River	0.036 – 0.050	0.050 – 0.100

Revised Analyses for Countywide FIS

For Saranac River, AuSable River, and Salmon River, water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (USACE, 1988; 1991). These computer models were calibrated using historic floodwater profiles. For the AuSable River and Salmon River, starting water surface elevations were computed using the slope-area method. Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Cross-section data for the Saranac River backwater analyses were obtained from aerial mapping used to produce topographic maps at a scale of 1: 4,800, with a 4-foot contour interval (Phillips & Associates, 2000). Cross-section data for the AuSable River backwater analyses were obtained from aerial mapping used to produce topographic maps at a scale of 1: 4,800, with a 4-foot contour interval (Atlantis Aerial Survey Co., 1998). The below-water sections were obtained by field measurements. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. Cross sections for the Salmon River were obtained from field measurements. Cross sections were located to define any major changes in the configurations of the channels and overbanks; they were also located at the upstream faces of bridges and dams in order to compute the significant backwater effects of these structures.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are valid only if hydraulic structures remain unobstructed and do not fail.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the FIRM (Exhibit 2).

Qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned inclusion criteria.

To obtain current elevation, description, and/or location information for bench marks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their Web site at www.ngs.noaa.gov.

It is important to note that temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with this FIS and FIRM. Interested individuals may contact FEMA to access this data.

3.3 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD 29). With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent communities may be referenced to NGVD 29. This may result in differences in base flood elevations across the corporate limits between the communities.

Prior versions of the FIS report and FIRM were referenced to NGVD 29. When a datum conversion is effected for an FIS report and FIRM, the Flood Profiles and base flood elevations (BFEs) reflect the new datum values. To compare structure and ground elevations to 1% annual chance (100-year) flood elevations shown in the FIS and on the FIRM, the subject structure and ground elevations must be referenced to the new datum values.

As noted above, the elevations shown in the FIS report and on the FIRM for Clinton County are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor. The conversion factor to NGVD 29 is +0.3.

The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 will appear as 102 on the FIRM and 102.6 will appear as 103. Therefore, users that wish to convert the elevations in this FIS to NGVD 29 should apply the stated conversion factor(s) to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1 foot.

For more information on NAVD 88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, FEMA Publication FIA-20/June 1992, or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://www.ngs.noaa.go).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1-percent annual chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent annual chance flood elevations; delineations of the 1- and 0.2-percent annual chance floodplains; and 1-percent annual chance floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance flood is employed to indicate additional areas of flood risk in the county. For the streams studied in detail, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section.

Precountywide Analyses

For Lake Champlain, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using topographic mapping at a scale of 1:24,000, with contour intervals of 10 and 20 feet (U. S. Department of the Interior, Geological Survey 1966). For the Great Chazy River, between cross sections, boundaries were interpolated using topographic mapping with a contour interval of 4 feet, at a scale of 1"=200' (Geomaps, Inc. 1996). For Button Brook, Little AuSable River and Silver Stream, between cross sections, boundaries were interpolated using topographic maps at a scale of 1:4,800, with a contour interval of 4 feet (MS Technologies, Inc. 1993). For the Salmon River, between cross sections, boundaries were interpolated using topographic mapping scales of 1:24,000 and 1:62,500, with contour intervals of 10 and 20 feet (U.S. Department of the Interior, 1966). For the Saranac River, between cross sections, boundaries were interpolated using topographic maps at a scale of 1:4,800, with a contour interval of 4 feet (Phillips & Associates, 1998).

For the streams studied by approximate methods, only the 1-percent annual chance floodplain boundary is shown on the FIRM (Exhibit 2).

For the flooding sources studied by approximate methods (other than those referenced below), the boundaries of the 1-percent annual chance floodplains were delineated using the previously printed FIS reports, FHBMs, and/or FIRMs for all of the incorporated communities within Clinton County.

Revised Analyses for Countywide FIS

For this countywide FIS, the floodplain boundaries along the reach of the Saranac River within the Town of Black Brook, were delineated using topographic maps at a scale of 1:4,800, with a contour interval of 4 feet (Phillips & Associates, 2000).

Floodplains for the following flooding sources have been redelineated using updated topographic data provided by the New York Department of Environmental Conservation (Spectrum Mapping LLC, 2002): AuSable River, Black Brook, Dry Mill Creek and tributaries, Fern Lake, Taylor Pond, Unnamed Tributary to AuSable River, and West Branch AuSable River.

The 1- and 0.2-percent annual chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent annual chance floodplain boundaries are close together, only the 1-percent annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodway in this study is presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this FIS were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain.

Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 6). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 6 for certain downstream cross sections of the Great Chazy River and the Saranac River are lower than the regulatory flood elevations in that area, which must take into account the 1-percent annual chance flooding due to backwater from other sources.

Portions of the floodway widths for the AuSable River and the West Branch AuSable River extend beyond the county boundary.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 6, "Floodway Data." In order to reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AuSable River								
A	2,355[1]	1,420	7,210	3.5	103.4	103.4	104.3	0.9
B	3,470[1]	295	3,141	8.1	104.3	104.3	105.2	0.9
C	5,290[1]	290	3,016	8.4	108.4	108.4	108.8	0.4
D	6,560[1]	279	2,747	9.3	110.7	110.7	111.2	0.5
E	1,355[2]	158[4]	2,022	12.4	497.2	497.2	497.6	0.4
F	3,440[2]	218[4]	2,653	9.4	505.1	505.1	505.9	0.8
G	5,335[2]	241[4]	2,886	8.7	509.9	509.9	510.7	0.8
H	7,660[2]	223[4]	2,727	9.2	514.4	514.4	515.3	0.9
I	9,805[2]	194[4]	2,564	9.8	519.2	519.2	520.1	0.9
J	12,180[2]	357[4]	4,183	6.0	525.1	525.1	526.0	0.9
K	14,440[2]	320[4]	2,292	10.9	530.5	530.5	531.0	0.5
L	16,845[2]	257[4]	2,591	9.7	542.5	542.5	542.9	0.4
Button Brook								
A	1,480[3]	20	93	6.5	285.8	285.8	285.9	0.1
B	2,400[3]	105	622	0.9	292.6	292.6	293.0	0.4
C	4,945[3]	13	57	10.5	311.6	311.6	311.8	0.2
D	7,500[3]	13	54	11.2	355.2	355.2	355.8	0.6
E	8,790[3]	48	312	1.7	362.2	362.2	362.7	0.5
F	10,005[3]	28	105	5.1	364.0	364.0	364.9	0.9

[1] Feet above Delaware and Hudson Railroad
[2] Feet above Limit of Detailed Study
[3] Feet above confluence with Little AuSable River
[4] Width extends beyond county boundary

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

AUSABLE RIVER – BUTTON BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Great Chazy River								
A	0[1]	290	2,528	3.2	101.7	96.6[3]	97.6	1.0
B	3,000[1]	258	2,689	3.1	101.7	97.4[3]	98.2	0.8
C	6,000[1]	182	2,132	3.9	101.7	99.0[3]	99.5	0.5
D	9,000[1]	176	2,178	3.4	101.7	100.0[3]	100.4	0.4
E	12,000[1]	184	2,189	3.4	101.7	100.6[3]	101.0	0.4
F	15,000[1]	172	2,215	3.4	101.7	101.1[3]	101.5	0.4
G	18,000[1]	160	1,954	3.8	101.7	101.7	102.1	0.4
H	21,000[1]	148	1,883	4.0	102.3	102.3	102.8	0.5
I	24,200[1]	126	1,574	4.8	103.1	103.1	103.5	0.4
J	27,300[1]	110	1,281	5.8	103.9	103.9	104.4	0.5
K	30,000[1]	98	546	13.5	111.2	111.2	111.3	0.1
L	32,800[1]	138	618	11.9	129.5	129.5	129.5	0.0
Little AuSable River								
A	485[2]	87	942	4.2	103.4	103.4	104.3	0.9
B	3,160[2]	198	1,206	3.3	104.8	104.8	105.8	1.0
C	5,525[2]	184	1,161	3.4	106.6	106.6	107.4	0.8
D	7,855[2]	176	1,272	3.1	108.5	108.5	109.4	0.9
E	10,690[2]	95	714	5.2	111.0	111.0	111.9	0.9
F	13,485[2]	120	774	4.8	114.8	114.8	115.5	0.7
G	17,790[2]	65	481	7.7	130.2	130.2	130.7	0.5
H	21,955[2]	59	521	7.1	144.2	144.2	144.9	0.7
I	25,590[2]	117	706	5.3	180.0	180.0	180.9	0.9
J	31,320[2]	32	264	14.1	261.7	261.7	262.6	0.9
K	33,200[2]	80	619	6.0	276.0	276.0	276.0	0.0
L	35,525[2]	145	1,267	2.3	280.3	280.3	281.0	0.7

[1]Feet above confluence with Lake Champlain
[2]Feet above Delaware and Hudson Railroad
[3]Elevation computed without consideration of backwater effects from Lake Champlain

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

GREAT CHAZY RIVER – LITTLE AUSABLE RIVER

TABLE 6

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Little AuSable River (continued)								
M	40,210[1]	70	637	4.1	284.2	284.2	285.0	0.8
N	44,160[1]	201	1,415	1.8	287.6	287.6	288.3	0.7
O	46,340[1]	137	576	4.5	290.1	290.1	291.1	1.0
P	48,340[1]	60	415	6.3	296.3	296.3	297.2	0.9
Q	50,280[1]	48	384	6.8	316.6	316.6	317.3	0.7
R	52,355[1]	69	456	5.7	320.7	320.7	321.5	0.8
Salmon River								
A	2,050[2]	53	319	6.9	245.6	245.6	246.2	0.6
B	4,050[2]	59	423	5.2	250.9	250.9	251.7	0.8
C	5,750[2]	44	351	6.3	258.2	258.2	258.3	0.1
D	7,750[2]	44	214	7.4	263.7	263.7	264.4	0.7
E	9,750[2]	51	268	5.9	269.9	269.9	270.9	1.0
F	11,890[2]	76	274	5.8	275.7	275.7	276.3	0.6
G	13,450[2]	72	331	4.8	283.9	283.9	284.8	0.9
H	15,450[2]	47	245	6.5	295.1	295.1	296.1	1.0
I	17,450[2]	90	416	3.8	304.1	304.1	304.4	0.3
J	21,450[2]	90	343	4.6	311.0	311.0	312.0	1.0
K	23,450[2]	166	294	5.4	332.0	332.0	332.0	0.0
L	25,650[2]	34	173	9.2	371.2	371.2	372.2	1.0
M	27,250[2]	42	153	10.4	423.8	423.8	423.8	0.0
N	28,450[2]	255	352	4.5	445.3	445.3	446.3	1.0
O	30,450[2]	37	156	10.2	483.4	483.4	483.4	0.0
P	32,650[2]	40	145	10.9	536.2	536.2	536.2	0.0

[1]Feet above Delaware and Hudson Railroad
[2]Feet above Limit of Detailed Study (Limit of Detailed Study is located approximately 1 mile upstream of I-87)

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

LITTLE AUSABLE RIVER – SALMON RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Salmon River (continued)								
Q	33,650[1]	30	132	12.0	550.5	550.5	550.5	0.0
R	35,650[1]	42	225	7.1	567.8	567.8	567.9	0.1
S	37,750[1]	69	218	7.3	580.1	580.1	580.4	0.3
T	38,850[1]	38	144	11.1	595.5	595.5	595.7	0.2
U	40,550[1]	38	154	10.3	617.7	617.7	618.0	0.3
V	42,550[1]	54	291	5.5	634.6	634.6	634.9	0.3
Saranac River								
A	1,300[2]	209	1,519	8.1	101.7	100.8[3]	101.7	0.9
B	1,730[2]	143	1,337	9.2	102.6	102.6	103.3	0.7
C	2,395[2]	109	1,115	11.0	105.7	105.7	106.1	0.4
D	3,120[2]	108	1,186	10.4	108.4	108.4	108.7	0.3
E	4,800[2]	195	1,518	8.1	115.8	115.8	115.9	0.1
F	6,740[2]	237	1,095	11.2	121.5	121.5	121.6	0.1
G	8,335[2]	218	1,527	8.1	132.8	132.8	132.9	0.1
H	10,025[2]	188	1,567	7.9	141.4	141.4	141.7	0.3
I	12,525[2]	746	3,036	4.1	148.7	148.7	149.0	0.3
J	13,880[2]	256	1,314	9.4	151.8	151.8	151.8	0.0
K	16,115[2]	125	875	14.1	160.4	160.4	160.8	0.4
L	17,040[2]	302	2,414	5.1	166.5	166.5	167.0	0.5
M	19,040[2]	785	7,605	1.6	187.1	187.1	187.1	0.0
N	20,640[2]	600	2,949	4.2	187.1	187.1	187.1	0.0
O	22,390[2]	176	934	13.2	190.8	190.8	190.8	0.0

[1] Feet above Limit of Detailed Study (Limit of Detailed Study is located approximately 1 mile upstream of I-87)
[2] Feet upstream of confluence with Lake Champlain
[3] Elevation computed without consideration of backwater effects from Lake Champlain

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

SALMON RIVER – SARANAC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Saranac River (continued)								
P	25,540	224	1,459	8.4	211.8	211.8	212.3	0.5
Q	28,265	160	1,436	8.6	243.1	243.1	243.3	0.2
R	30,830	143	1,352	9.1	258.1	258.1	258.9	0.8
S	33,900	606	6,334	1.1	285.3	285.3	285.8	0.5
T	36,870	147	1,216	10.1	289.1	289.1	289.9	0.8
U	38,040	219	1,659	7.4	293.4	293.4	294.0	0.6
V	40,565	180	1,360	9.0	302.9	302.9	303.4	0.5
W	44,455	244	1,501	8.2	319.3	319.3	319.8	0.5
X	47,195	195	1,010	12.2	330.2	330.2	330.4	0.2
Y	51,010	160	965	11.2	346.3	346.3	347.0	0.7
Z	53,820	282	2,170	5.0	359.7	359.7	360.3	0.6
AA	57,090	278	1,475	7.3	375.0	375.0	375.5	0.5
AB	59,425	211	1,423	7.6	386.2	386.2	386.8	0.6
AC	61,300	220	1,296	8.4	395.2	395.2	395.5	0.3
AD	64,605	189	1,107	9.8	413.7	413.7	414.2	0.5
AE	67,265	82	665	16.3	451.1	451.1	451.4	0.3
AF	69,670	197	5,782	1.9	589.7	589.7	590.6	0.9
AG	72,760	494	7,129	1.5	589.9	589.9	590.8	0.9
AH	75,510	187	3,434	3.2	656.4	656.4	657.3	0.9
AI	76,900	83	1,356	8.0	656.7	656.7	657.6	0.9
AJ	79,175	702	11,990	0.9	734.4	734.4	735.3	0.9
AK	81,045	354	9,264	1.2	734.6	734.6	735.6	1.0
AL	84,015	489	7,544	1.4	734.6	734.6	735.6	1.0
AM	86,415	370	4,566	2.4	734.7	734.7	735.7	1.0
AN	88,175	352	4,217	2.6	735.0	735.0	735.9	0.9

[1]Feet upstream of confluence with Lake Champlain

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

SARANAC RIVER

TABLE 6

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Saranac River (continued)								
AO	89,740	266	3,338	3.2	735.5	735.5	736.3	0.8
AP	90,555	222	2,697	4.0	735.8	735.8	736.6	0.8
AQ	91,465	242	3,263	3.3	737.0	737.0	738.0	1.0
AR	92,660	303	3,581	3.0	737.5	737.5	738.3	0.8
AS	95,190	721	7,224	1.5	737.9	737.9	738.7	0.8
AT	97,950	676	7,216	1.5	738.1	738.1	739.0	0.9
AU	100,685	754	7,939	1.4	738.3	738.3	739.2	0.9
AV	102,515	746	7,610	1.4	738.4	738.4	739.3	0.9
AW	104,670	760	7,453	1.4	738.6	738.6	739.5	0.9
AX	106,945	626	5,754	1.9	738.8	738.8	739.8	1.0
AY	108,795	634	6,528	1.4	739.0	739.0	740.0	1.0
AZ	110,150	653	5,581	1.7	739.1	739.1	740.1	1.0
BA	111,660	381	4,864	1.9	739.2	739.2	740.2	1.0
BB	114,475	795	6,355	1.5	739.5	739.5	740.5	1.0
BC	115,025	841	6,627	1.4	739.5	739.5	740.5	1.0
BD	117,250	545	3,681	2.5	739.8	739.8	740.8	1.0
BE	119,325	271	2,430	3.9	740.8	740.8	741.7	0.9
BF	120,440	244	1,462	6.4	742.2	742.2	742.8	0.6
BG	123,750	161	1,298	7.2	753.4	753.4	754.0	0.6
BH	125,845	165	1,155	8.1	758.8	758.8	759.2	0.4
BI	127,740	207	1,484	6.3	764.9	764.9	765.2	0.3
BJ	129,950	131	891	10.5	775.5	775.5	776.2	0.7
BK	130,960	145	971	8.9	782.2	782.2	783.2	1.0
BL	133,060	161	1,403	6.1	796.4	796.4	797.1	0.7

[1]Feet upstream of confluence with Lake Champlain

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

SARANAC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Saranac River (continued)								
BM	133,640	47	490	17.6	878.1	878.1	879.0	0.9
BN	134,245	57	857	10.1	944.2	944.2	944.9	0.7
BO	135,800	371	9,302	0.9	1,041.2	1,041.2	1,041.2	0.0
BP	137,695	343	8,400	1.0	1,041.2	1,041.2	1,041.2	0.0
BQ	139,480	208	3,888	2.2	1,041.2	1,041.2	1,041.2	0.0
BR	141,325	312	3,318	2.6	1,041.4	1,041.4	1,041.4	0.0
BS	143,360	240	1,743	4.9	1,042.5	1,042.5	1,042.6	0.1
BT	146,045	236	1,313	6.6	1,051.0	1,051.0	1,051.1	0.1
BU	147,210	190	1,021	8.4	1,054.0	1,054.0	1,054.2	0.2
BV	148,910	222	1,387	6.2	1,060.3	1,060.3	1,060.5	0.2
BW	150,850	98	605	14.2	1,070.2	1,070.2	1,070.2	0.0
BX	151,580	147	1,568	5.5	1,076.7	1,076.7	1,077.1	0.4
BY	153,320	300	2,112	4.1	1,084.1	1,084.1	1,084.2	0.1
BZ	154,990	169	1,052	8.1	1,086.2	1,086.2	1,086.4	0.2
CA	156,665	190	1,341	6.4	1,090.7	1,090.7	1,090.8	0.1
CB	159,035	293	1,318	6.5	1,095.8	1,095.8	1,095.9	0.1
CC	160,265	214	847	10.2	1,099.9	1,099.9	1,099.9	0.0
CD	162,120	241	1,109	7.8	1,109.0	1,109.0	1,109.2	0.2
CE	165,790	210	755	8.2	1,137.6	1,137.6	1,137.7	0.1
CF	169,254	152	534	10.9	1,173.1	1,173.1	1,173.1	0.0
CG	172,215	167	553	10.5	1,201.9	1,201.9	1,201.9	0.0
CH	175,672	179	563	10.2	1,237.1	1,237.1	1,237.1	0.0
CI	175,841	203	901	6.4	1,243.3	1,243.3	1,243.3	0.0

[1]Feet upstream of confluence with Lake Champlain

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

SARANAC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Saranac River (continued)								
CJ	178,700	235	617	9.3	1,276.7	1,276.7	1,276.7	0.0
CK	179,966	131	493	12.5	1,300.3	1,300.3	1,300.3	0.0
CL	181,068	96	1,230	4.7	1,303.8	1,303.8	1,303.9	0.1
CM	182,654	111	1,292	4.4	1,304.4	1,304.4	1,304.8	0.4
CN	185,529	532	2,797	3.3	1,305.1	1,305.1	1,306.0	0.9
CO	187,685	165	553	10.4	1,308.0	1,308.0	1,308.0	0.0
CP	187,963	106	473	12.1	1,312.0	1,312.0	1,312.0	0.0
CQ	190,773	72	418	13.7	1,327.1	1,327.1	1,327.2	0.1
CR	191,956	106	876	6.5	1,332.3	1,332.3	1,332.6	0.3
CS	194,123	92	452	12.7	1,338.0	1,338.0	1,338.0	0.0
CT	196,704	189	891	6.7	1,343.5	1,343.5	1,343.9	0.4
CU	197,609	95	469	13.2	1,351.0	1,351.0	1,351.0	0.0
CV	198,199	256	1,482	5.8	1,354.0	1,354.0	1,354.7	0.7
CW	199,119	365	2,157	3.5	1,354.9	1,354.9	1,355.4	0.5
CX	201,858	285	2,002	3.0	1,355.8	1,355.8	1,356.4	0.6
CY	203,764	130	1,285	4.5	1,356.4	1,356.4	1,357.1	0.7
CZ	208,706	154	1,283	4.5	1,358.2	1,358.2	1,358.9	0.7
DA	210,338	192	581	9.9	1,413.6	1,413.6	1,413.8	0.2

[1]Feet upstream of confluence with Lake Champlain

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

SARANAC RIVER

TABLE 6

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Silver Stream								
A	230[1]	28	96	6.8	103.2	103.2	103.2	0.0
B	2,340[1]	30	126	5.2	122.7	122.7	123.3	0.6
C	4,760[1]	75	506	1.3	133.7	133.7	133.8	0.1
D	5,585[1]	55	161	4.0	133.8	133.8	134.2	0.4
E	6,800[1]	75	302	2.1	139.0	139.0	139.9	0.9
F	7,860[1]	100	424	1.5	140.6	140.6	141.5	0.9
G	10,610[1]	65	277	2.3	148.6	148.6	149.5	0.9
H	13,105[1]	55	244	1.6	152.9	152.9	153.2	0.3
I	14,485[1]	40	81	4.7	156.3	156.3	156.5	0.2
J	16,025[1]	40	155	1.0	159.6	159.6	160.5	0.9
K	17,070[1]	12	25	6.1	165.6	165.6	166.3	0.7
L	17,825[1]	30	76	2.0	171.1	171.1	171.5	0.4
M	18,920[1]	6	16	9.4	183.4	183.4	183.5	0.1
West Branch AuSable River								
A	305[2]	120[3]	1,452	9.6	552.6	552.6	553.2	0.6
B	545[2]	89[3]	921	15.2	553.3	553.3	553.9	0.6
C	1,475[2]	134[3]	1,510	9.3	562.6	562.6	563.4	0.8
D	2,205[2]	205[3]	1,205	11.6	567.4	567.4	568.0	0.6
E	2,870[2]	110[3]	1,004	13.9	576.4	576.4	576.4	0.0
F	3,370[2]	146[3]	1,396	10.0	582.0	582.0	582.2	0.2

[1]Feet upstream of confluence with Lake Champlain
[2]Feet above confluence with AuSable River
[3]Width extends beyond county boundary

TABLE 6

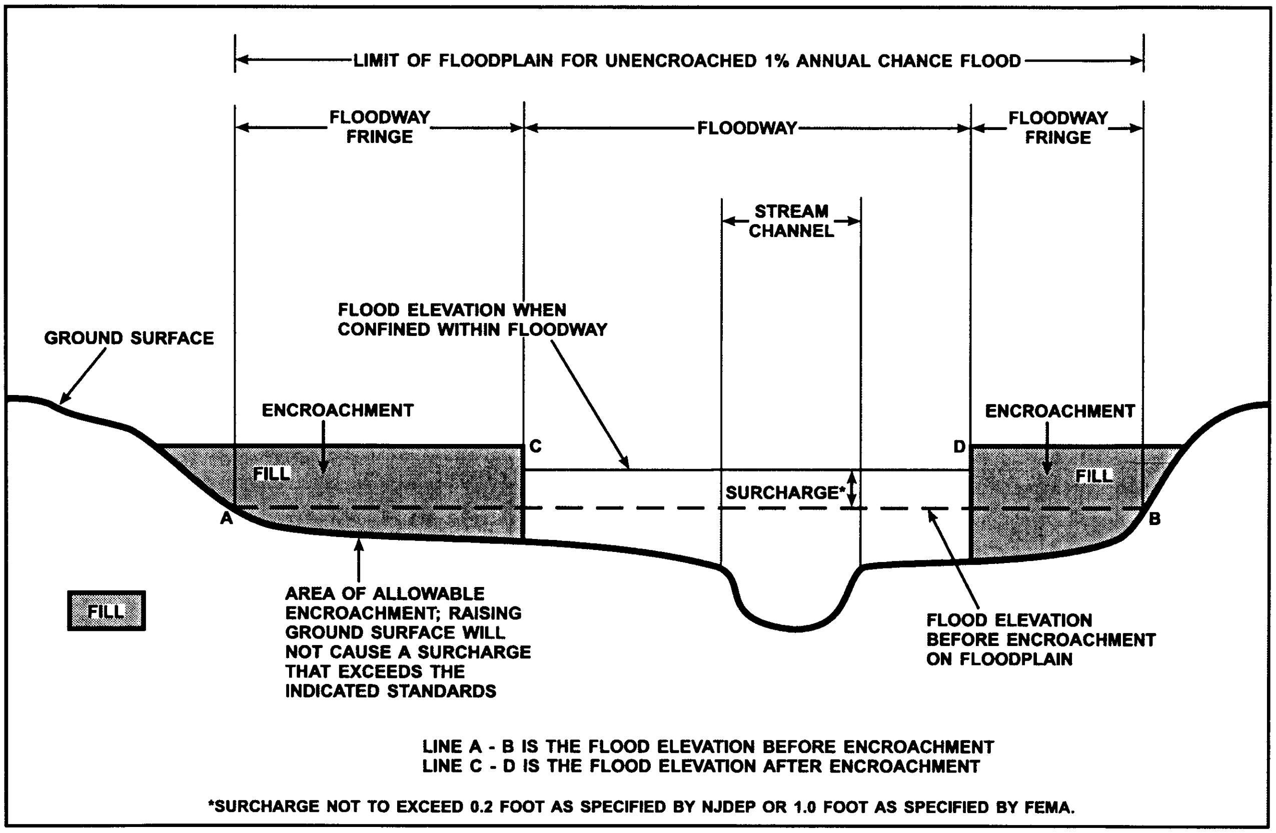
FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY
(ALL JURISDICTIONS)

FLOODWAY DATA

SILVER STREAM - WEST BRANCH AUSABLE RIVER

The area between the floodway and 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent annual chance flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.



FLOODWAY SCHEMATIC Figure 1

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Area of special flood hazard formerly protected from the 1-percent annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1-percent annual chance or greater flood event.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 1-percent annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 1-percent annual chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 1-percent annual chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent annual chance floodplain, areas within the 0.2-percent annual chance floodplain, and to areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent annual chance flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent annual chance floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent annual chance floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

The current FIRM presents flooding information for the entire geographic area of Clinton County. Previously, separate Flood Hazard Boundary Maps and/or FIRMs were prepared for each identified flood-prone incorporated community in the county. This countywide FIRM also includes flood hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community, up to and including this countywide FIS, are presented in Table 7, "Community Map History."

7.0 OTHER STUDIES

FISs and FIRMs have been prepared for the Towns of Chesterfield (FEMA, 1987), Jay (FEMA, 2002) and Wilmington (FEMA, 1995) in Essex County, New York (to the south of Clinton County), the Towns of Alburg (FEMA, 1980), Isle La Motte (FEMA, 1979), North Hero (FEMA, 1980), Grand Isle (FEMA, 1988), South Hero (FIA, 1977) in Grand Isle County, Vermont and the Town of Colchester (FEMA, 1982) in Chittenden County, Vermont (all to the east of Clinton County). In addition, FIRMs have been prepared for the Towns of Franklin (FEMA, 1984) and Bellmont (FEMA, 1985) in Franklin County, New York (to the west of Clinton County).

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Clinton County has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS Reports, FHBMs, FBFMs, and FIRMs for all jurisdictions within Clinton County.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Altona, Town of	January 3, 1975	None	February 1, 1985	September 28, 2007
Ausable, Town of	May 13, 1977	None	May 15, 1985	September 28, 2007
Beekmantown, Town of	February 27, 1976	None	May 4, 1987	September 28, 2007
Black Brook, Town of	January 10, 1975	February 27, 1976	August 15, 1983	September 28, 2007
Champlain, Town of	November 18, 1975	None	September 4, 1987	July 19, 2001 September 28, 2007
Champlain, Village of	May 31, 1974	July 23, 1976	June 5, 1985	July 19, 2001 September 28, 2007
Chazy, Town of	August 5, 1977	None	May 19, 1987	September 28, 2007
Clinton, Town of	January 24, 1975	None	September 28, 2007	September 28, 2007
Ellenburg, Town of	March 3, 1975	None	March 4, 1986	September 28, 2007
Keeseville, Village of	May 31, 1974	May 21, 1976 November 14, 1980	June 5, 1985	September 28, 2007
Mooers, Town of	February 14, 1975	None	June 19, 1985	September 28, 2007
Peru, Town of	February 21, 1975	None	May 4, 1987	October 20, 2000 September 28, 2007

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY
(ALL JURISDICTIONS)

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Plattsburgh, City of	January 4, 1974	January 23, 1976	April 17, 1978	June 3, 2003 September 28, 2007
Plattsburgh, Town of	August 30, 1974	September 26, 1975	September 28, 1979	June 3, 2003 September 28, 2007
Rouses Point, Village of	June 14, 1974	May 7, 1976	August 4, 1987	September 28, 2007
Saranac, Town of	April 18, 1975	None	June 5, 1985	June 3, 1992 July 2, 2003 September 28, 2007
Schuyler Falls, Town of	September 13, 1974	September 17, 1976	September 24, 1984	September 30, 1992 May 17, 2004 September 28, 2007

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY
(ALL JURISDICTIONS)

COMMUNITY MAP HISTORY

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this FIS can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

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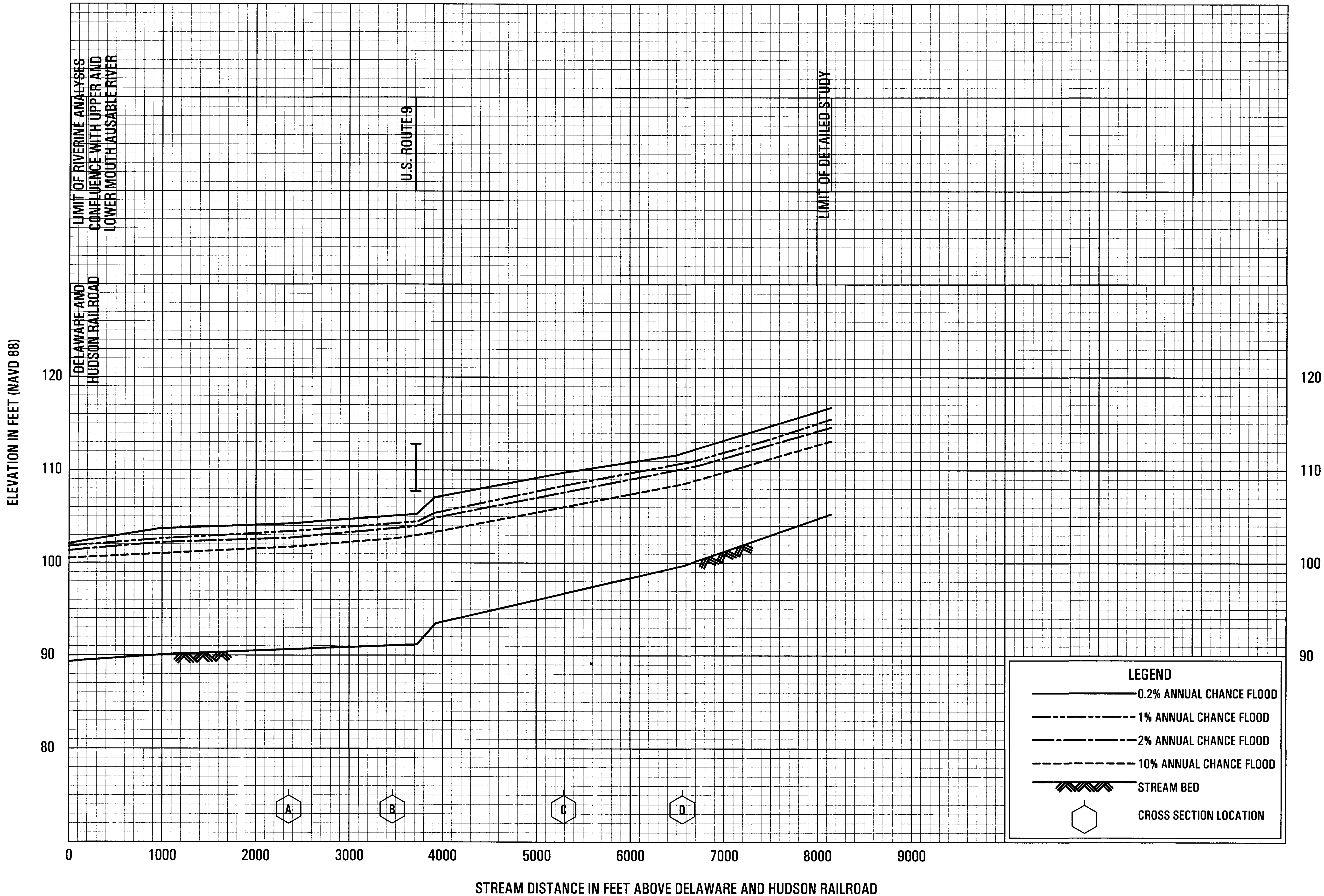

FLOOD PROFILES

AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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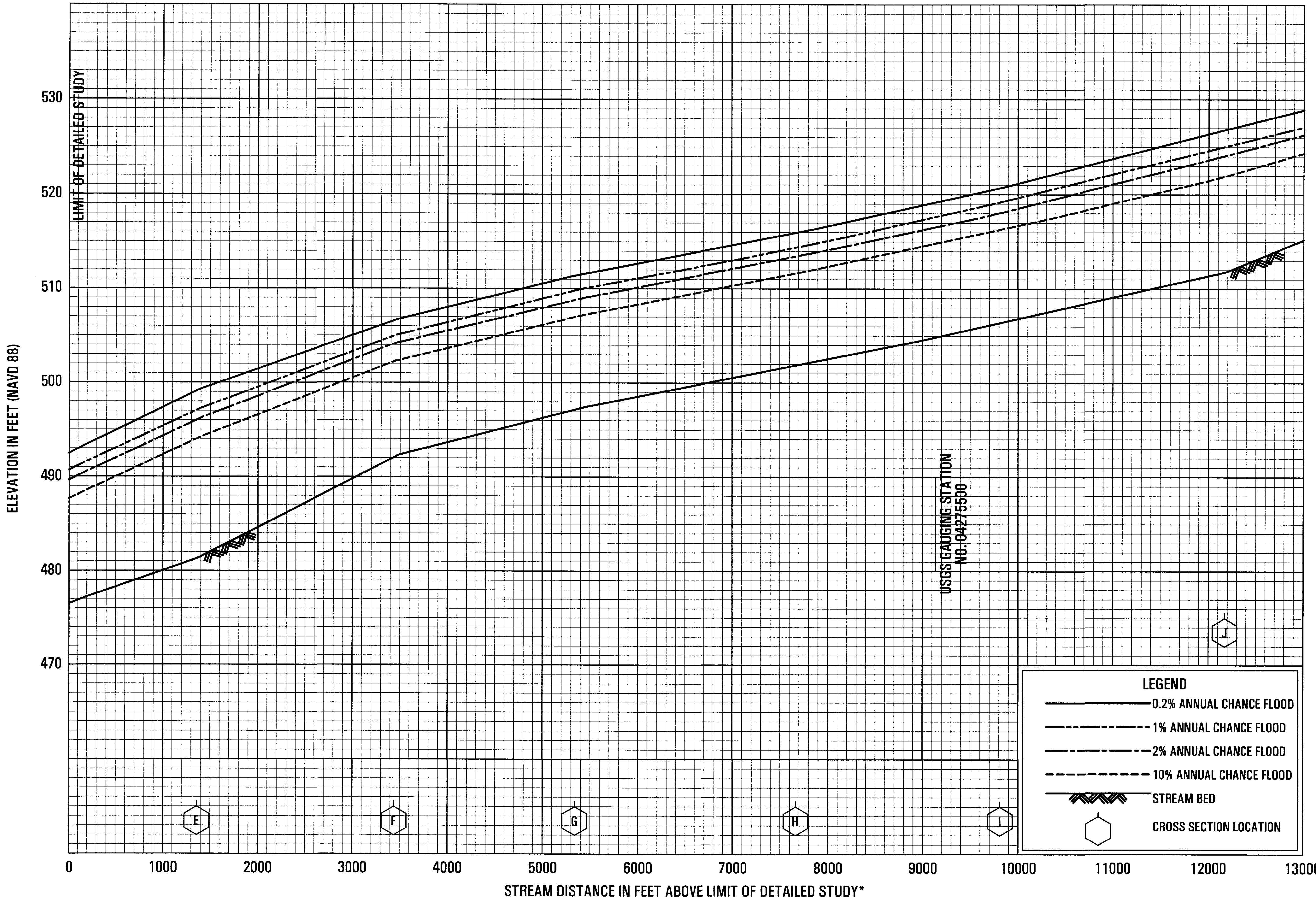

*LIMIT OF DETAILED STUDY IS LOCATED APPROXIMATELY 2.2 MILES UPSTREAM OF LOWER ROAD BRIDGE

FLOOD PROFILES

AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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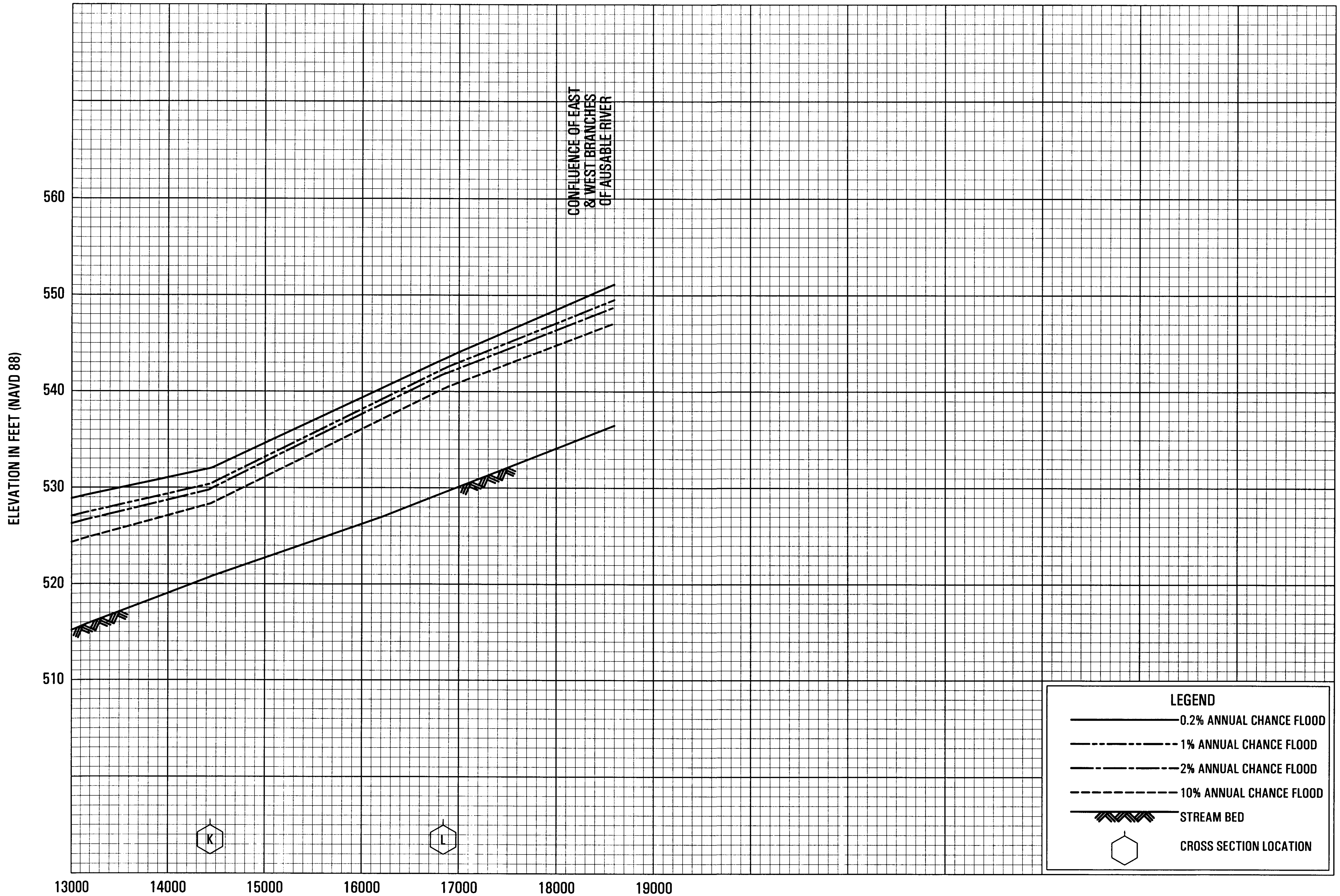

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FLOOD PROFILES

AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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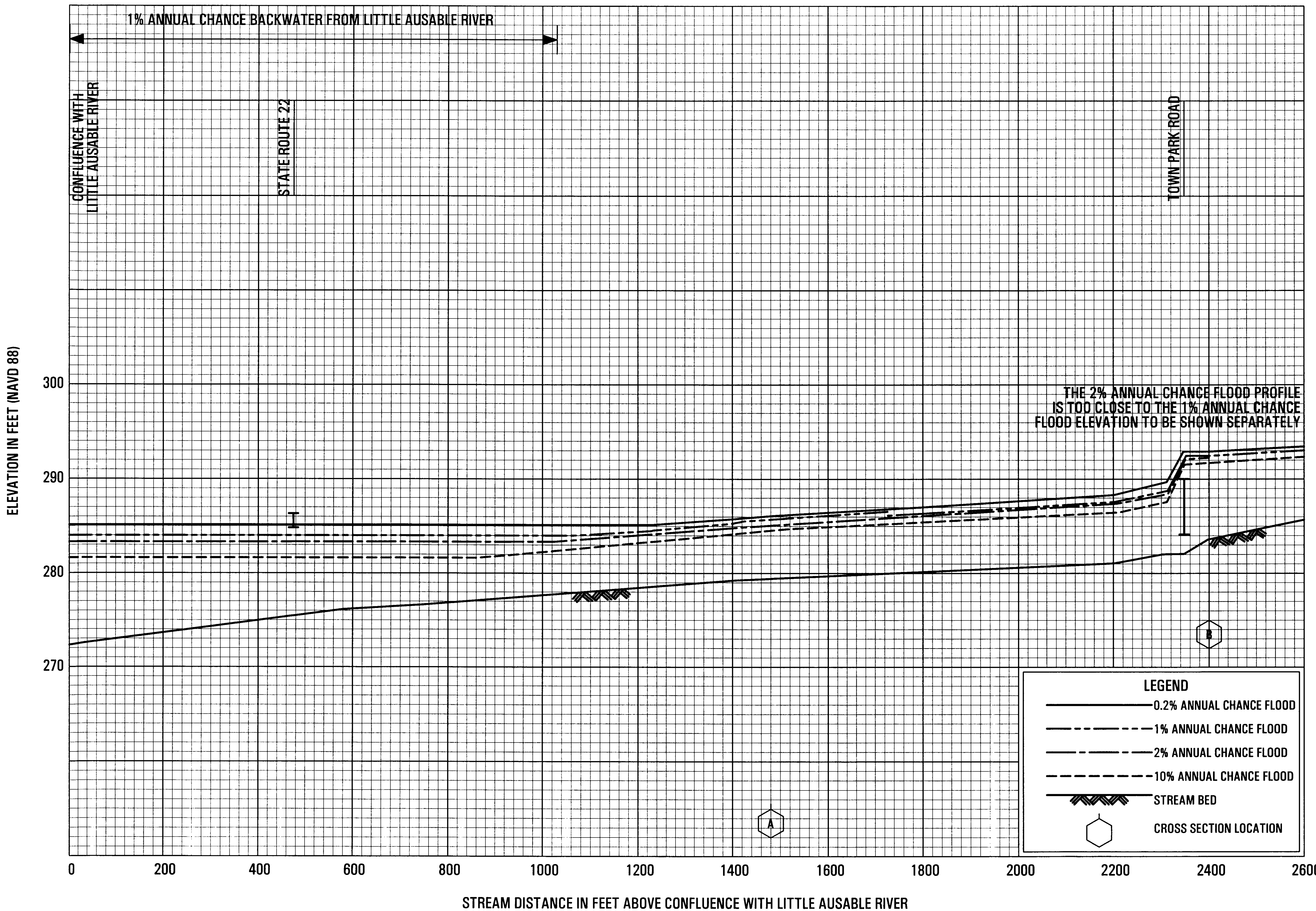

FLOOD PROFILES

BUTTON BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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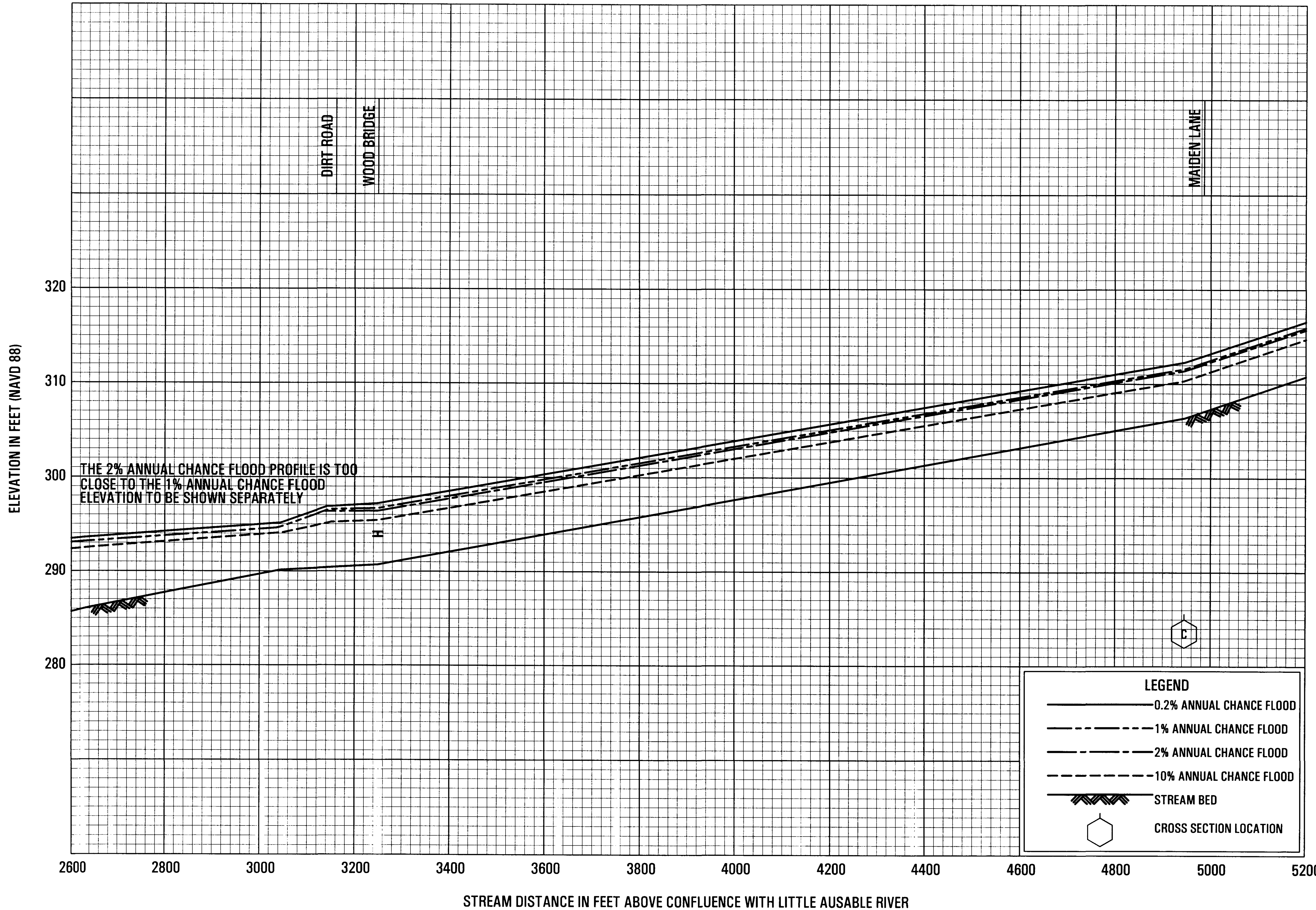

FLOOD PROFILES

BUTTON BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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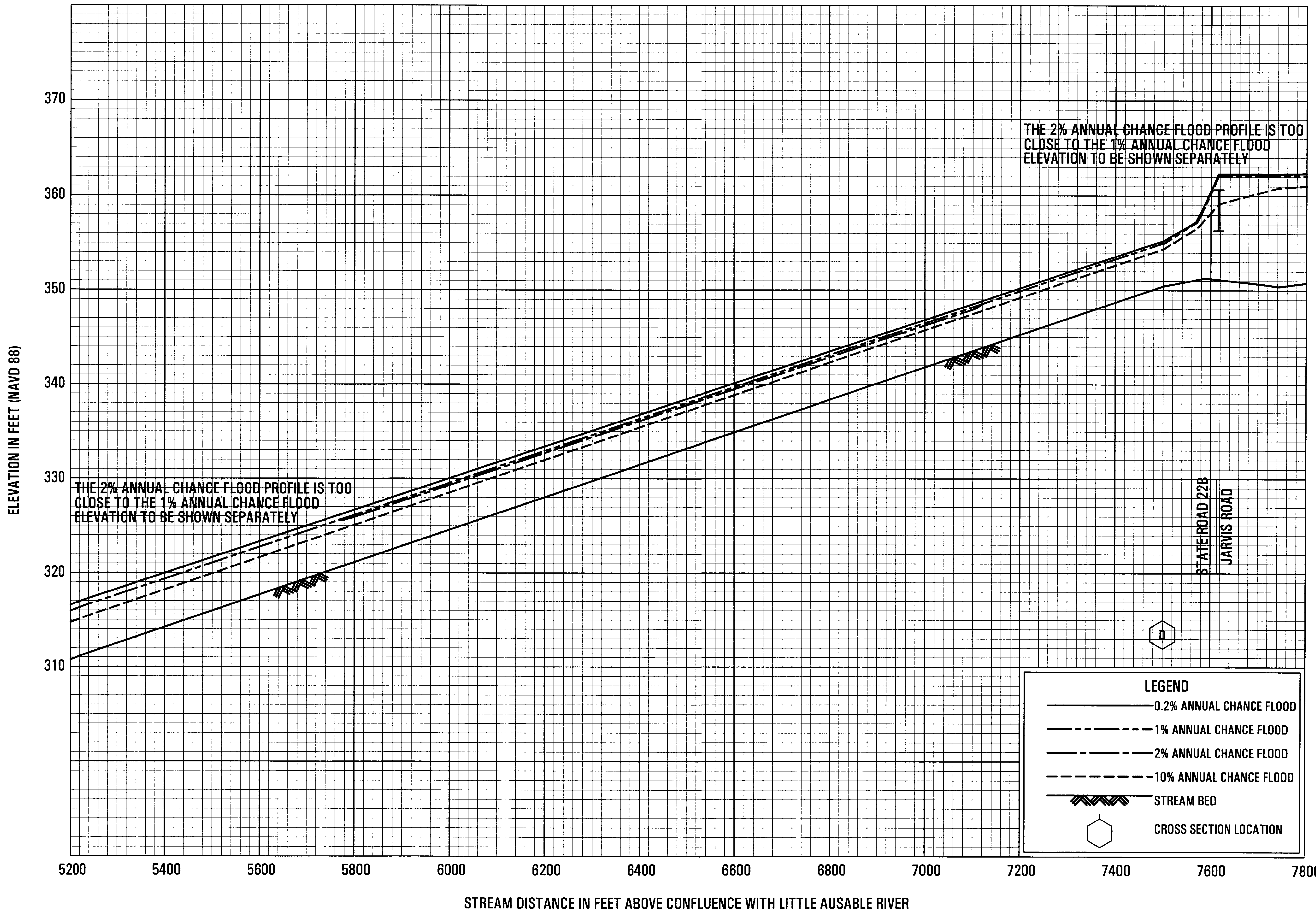

FLOOD PROFILES

BUTTON BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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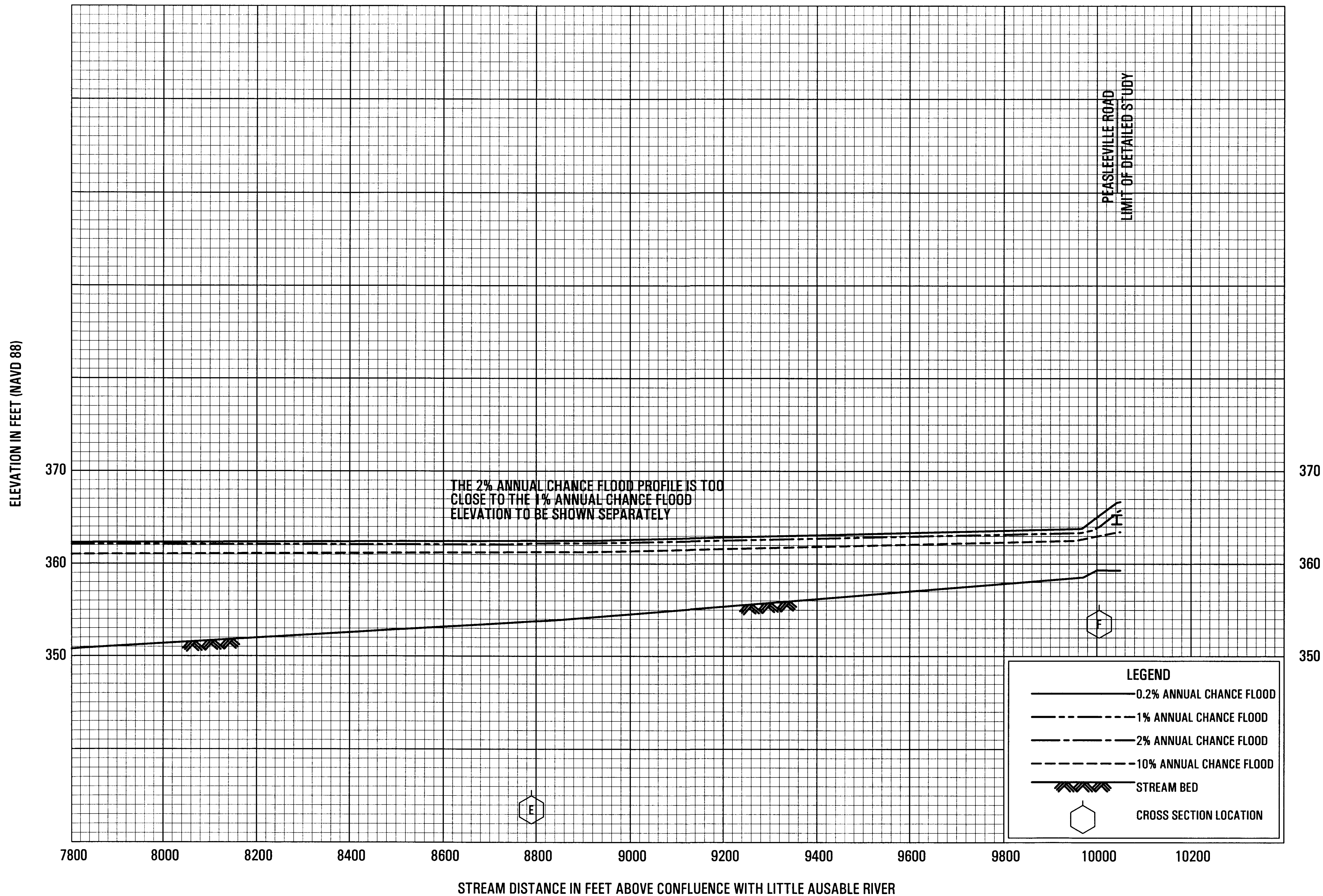

FLOOD PROFILES

BUTTON BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY
(ALL JURISDICTIONS)

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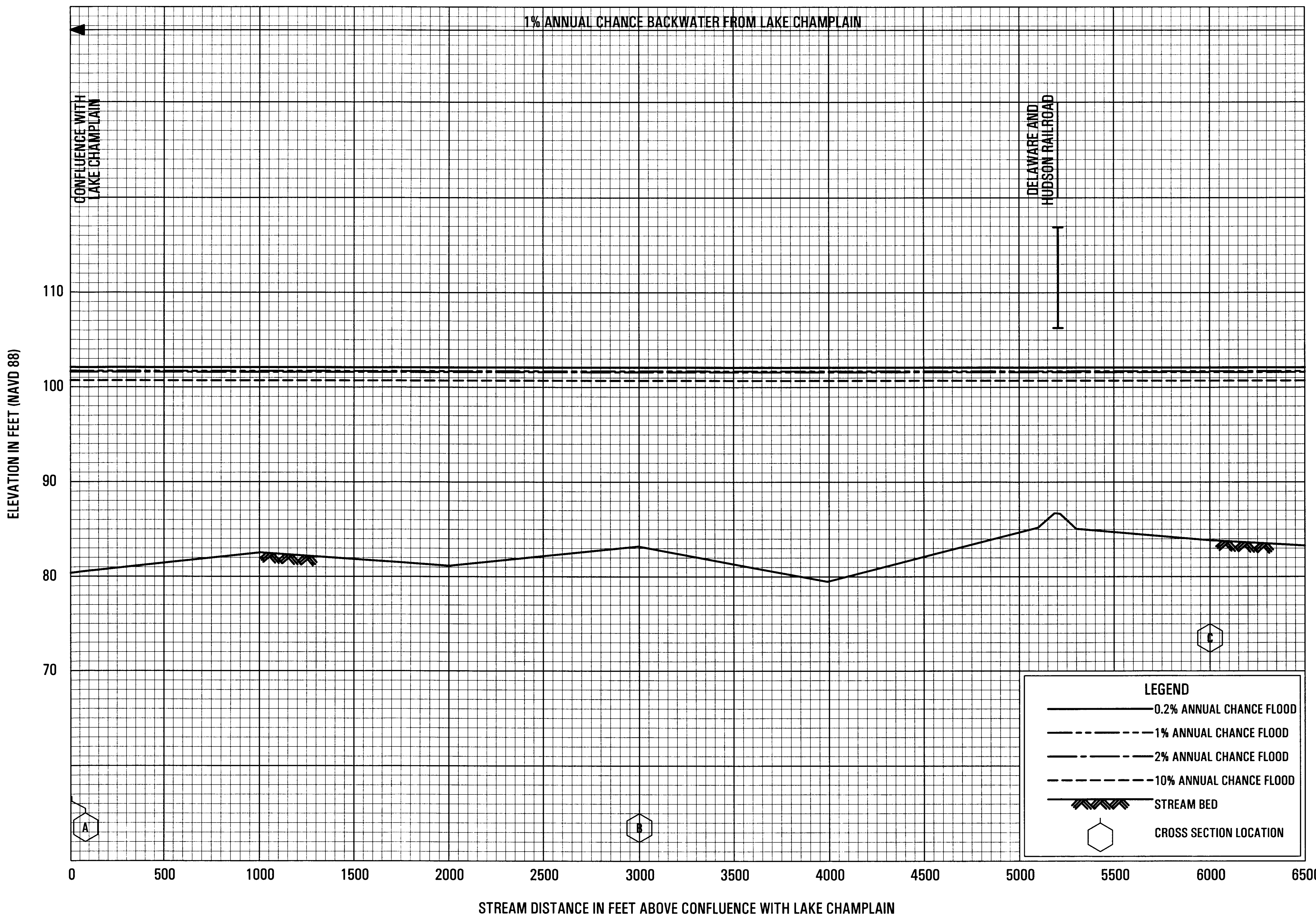

FLOOD PROFILES

GREAT CHAZY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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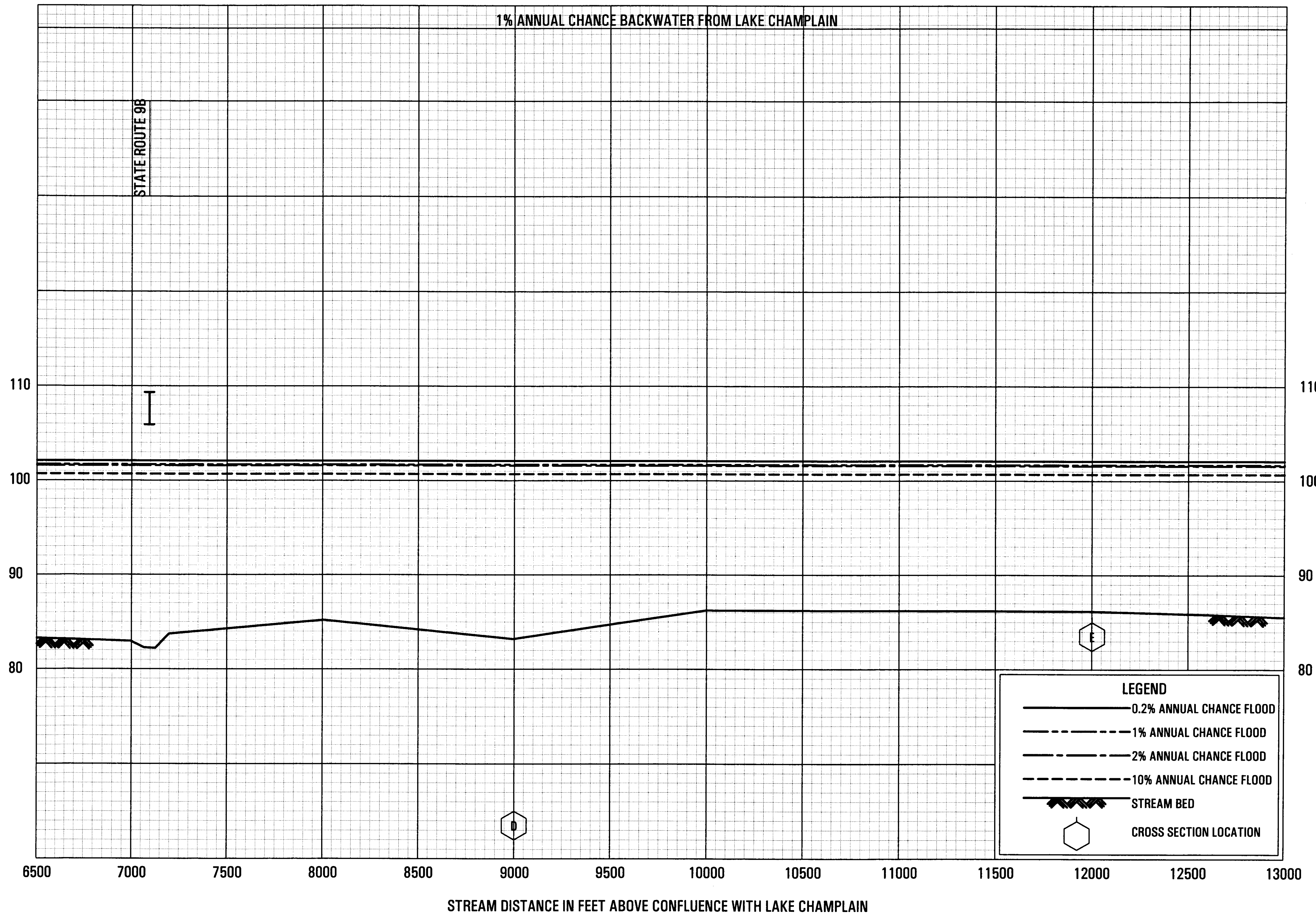

FLOOD PROFILES

GREAT CHAZY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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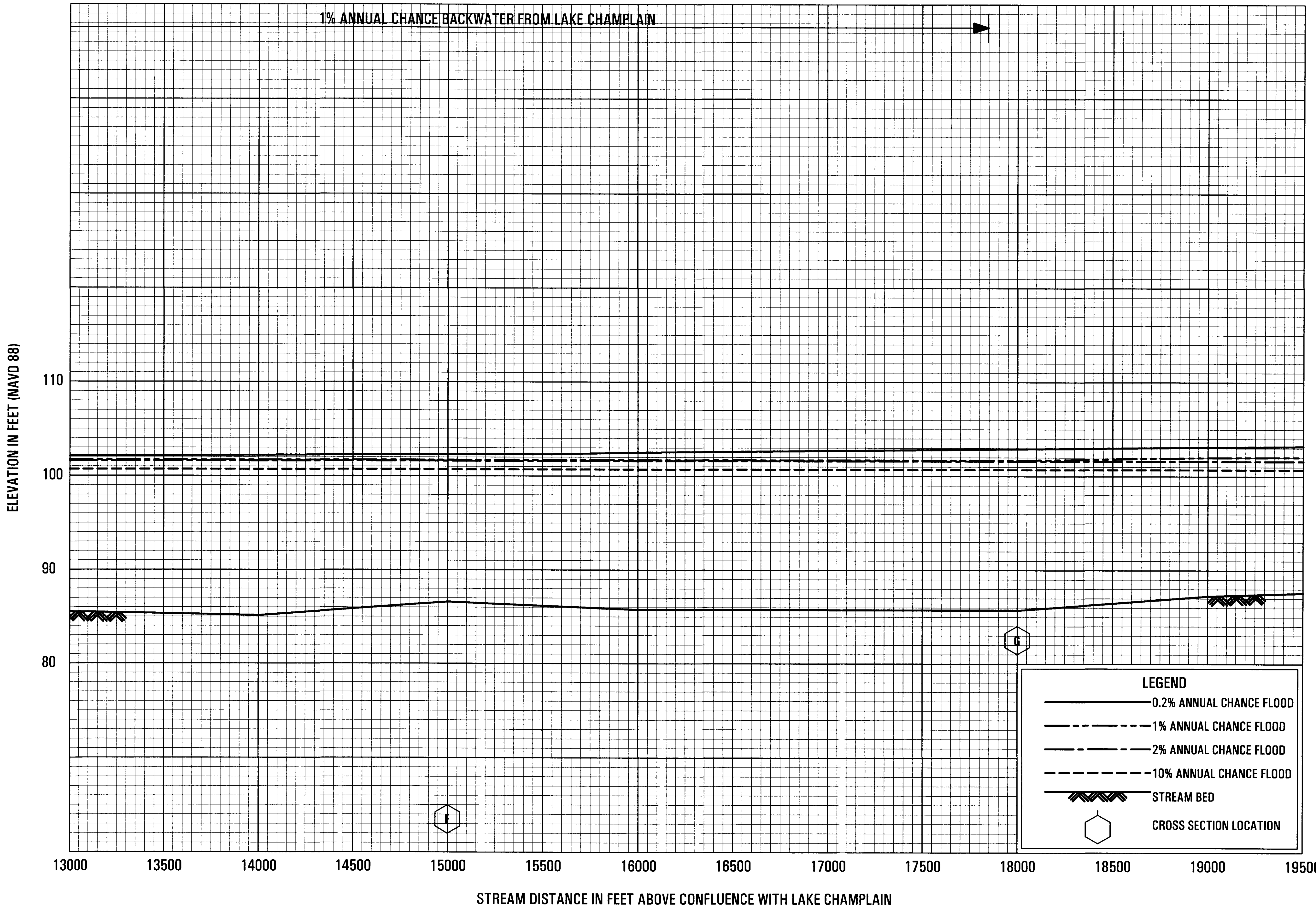

FLOOD PROFILES

GREAT CHAZY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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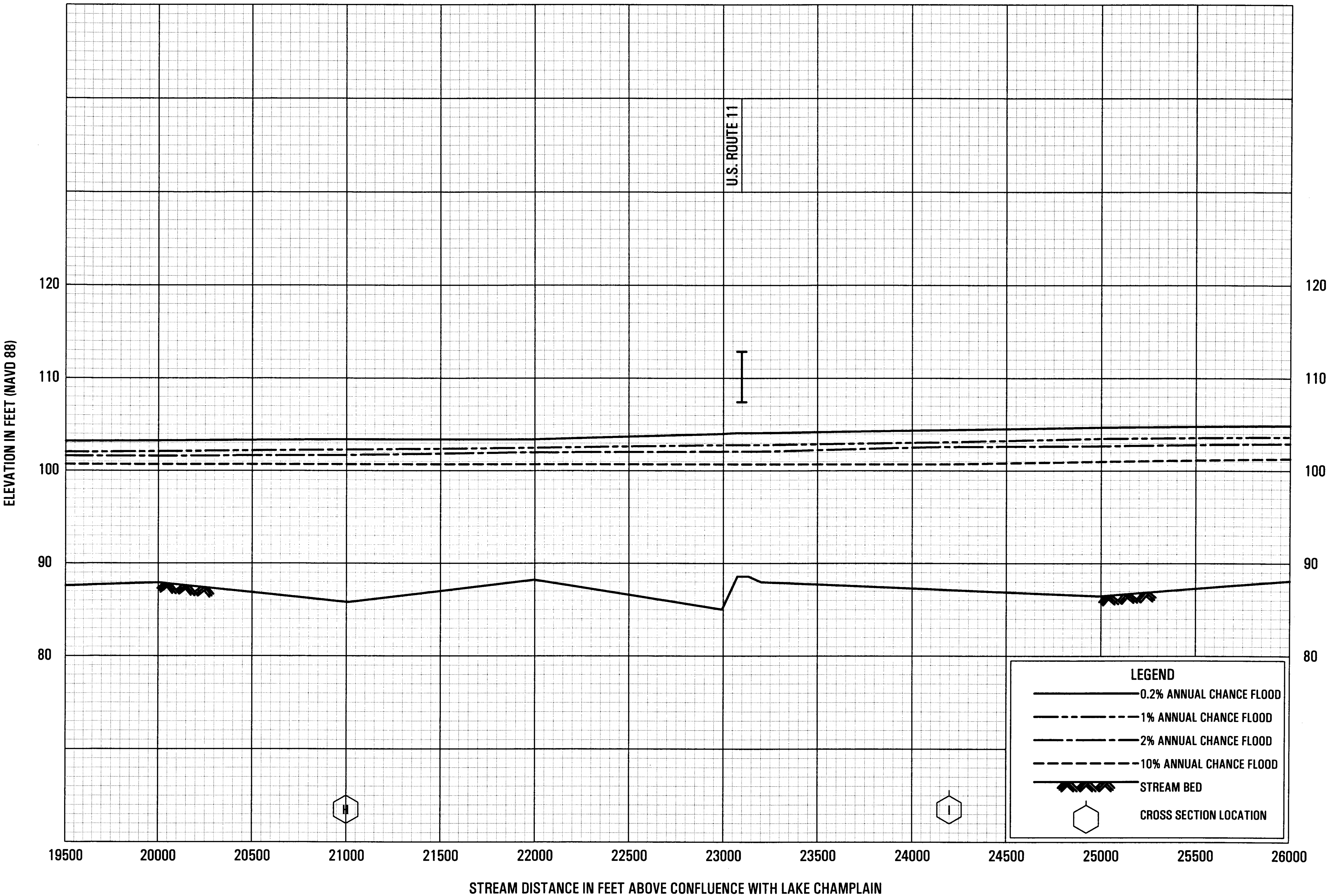


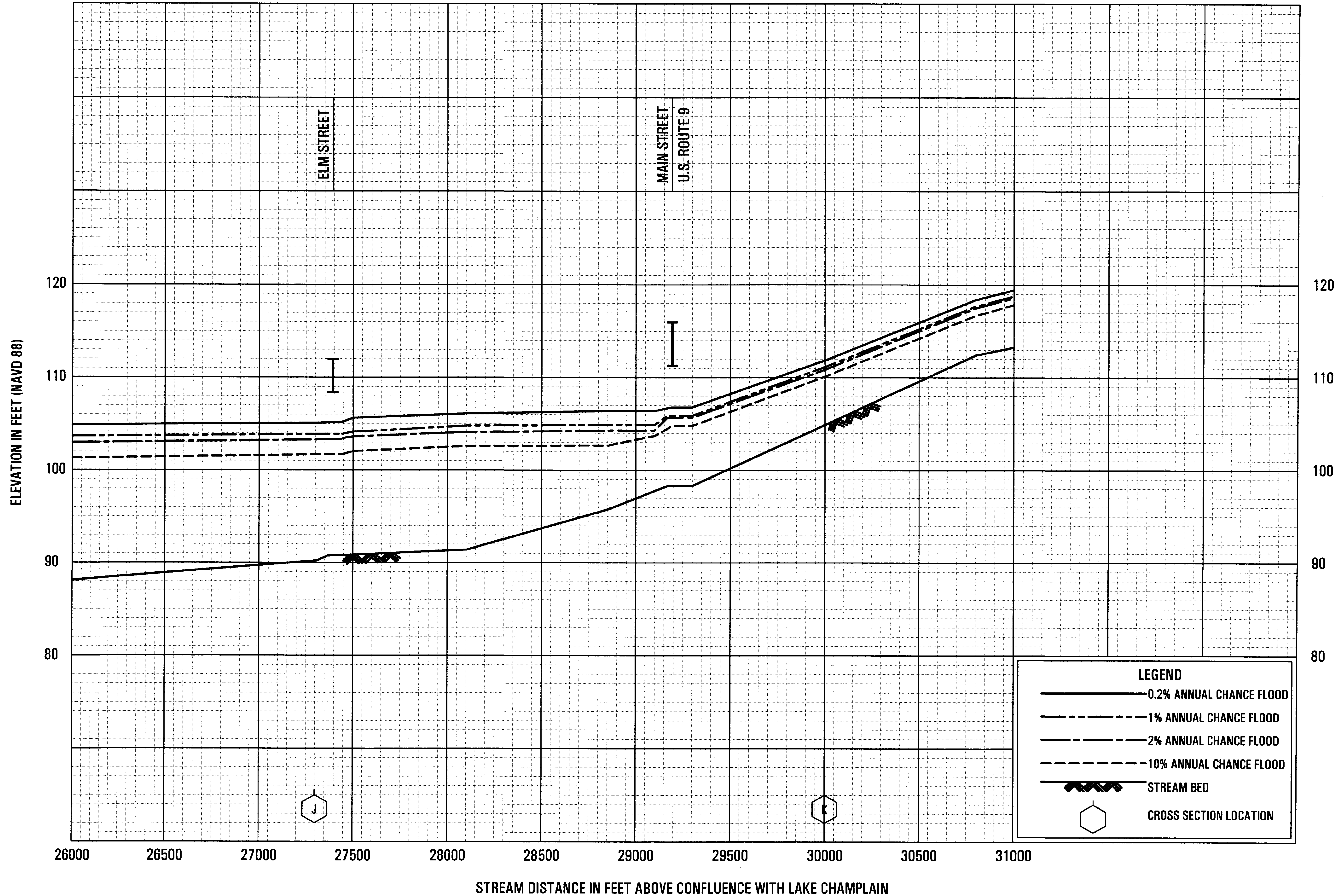
FLOOD PROFILES

GREAT CHAZY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

GREAT CHAZY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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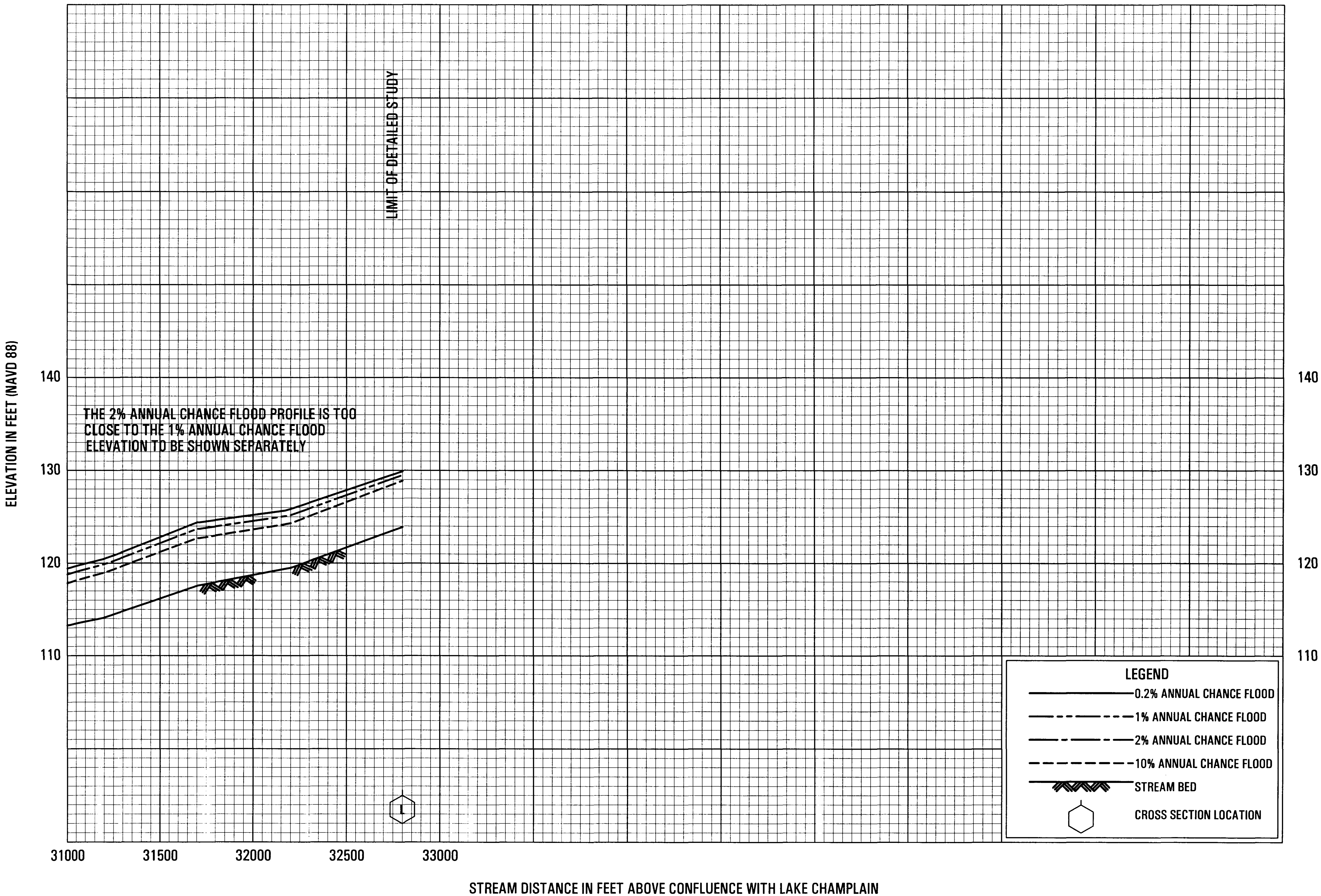


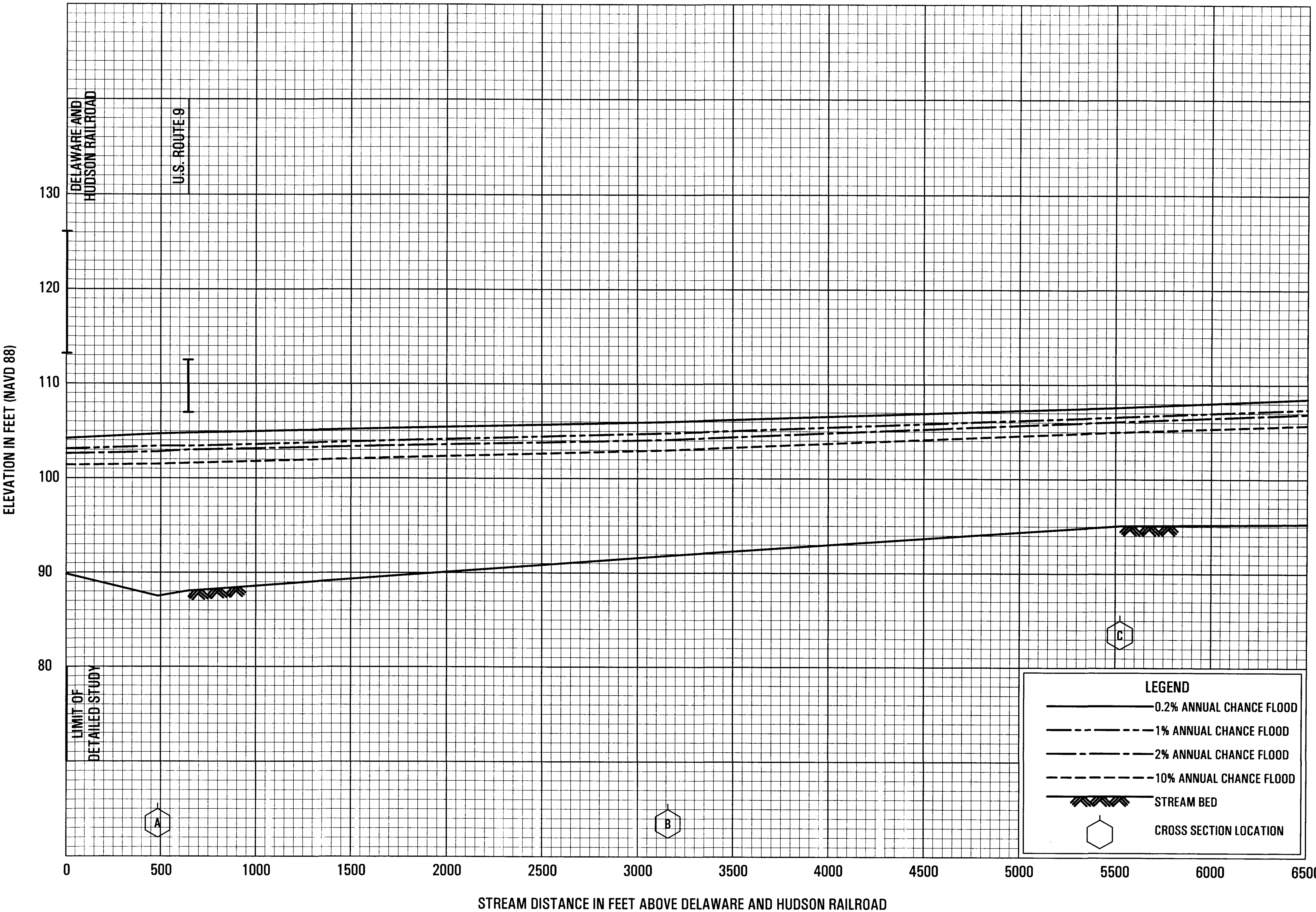
FLOOD PROFILES

GREAT CHAZY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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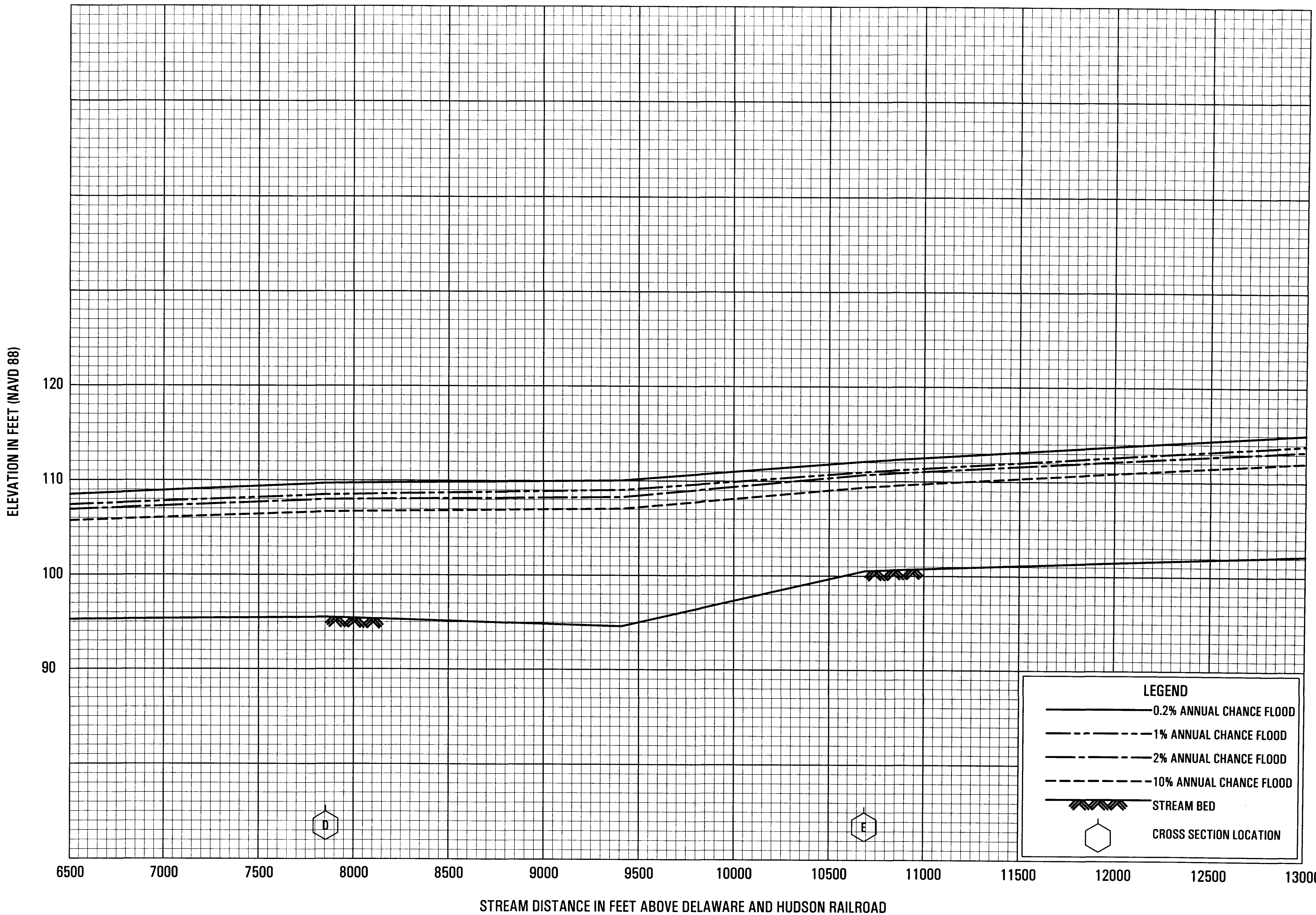

FLOOD PROFILES

LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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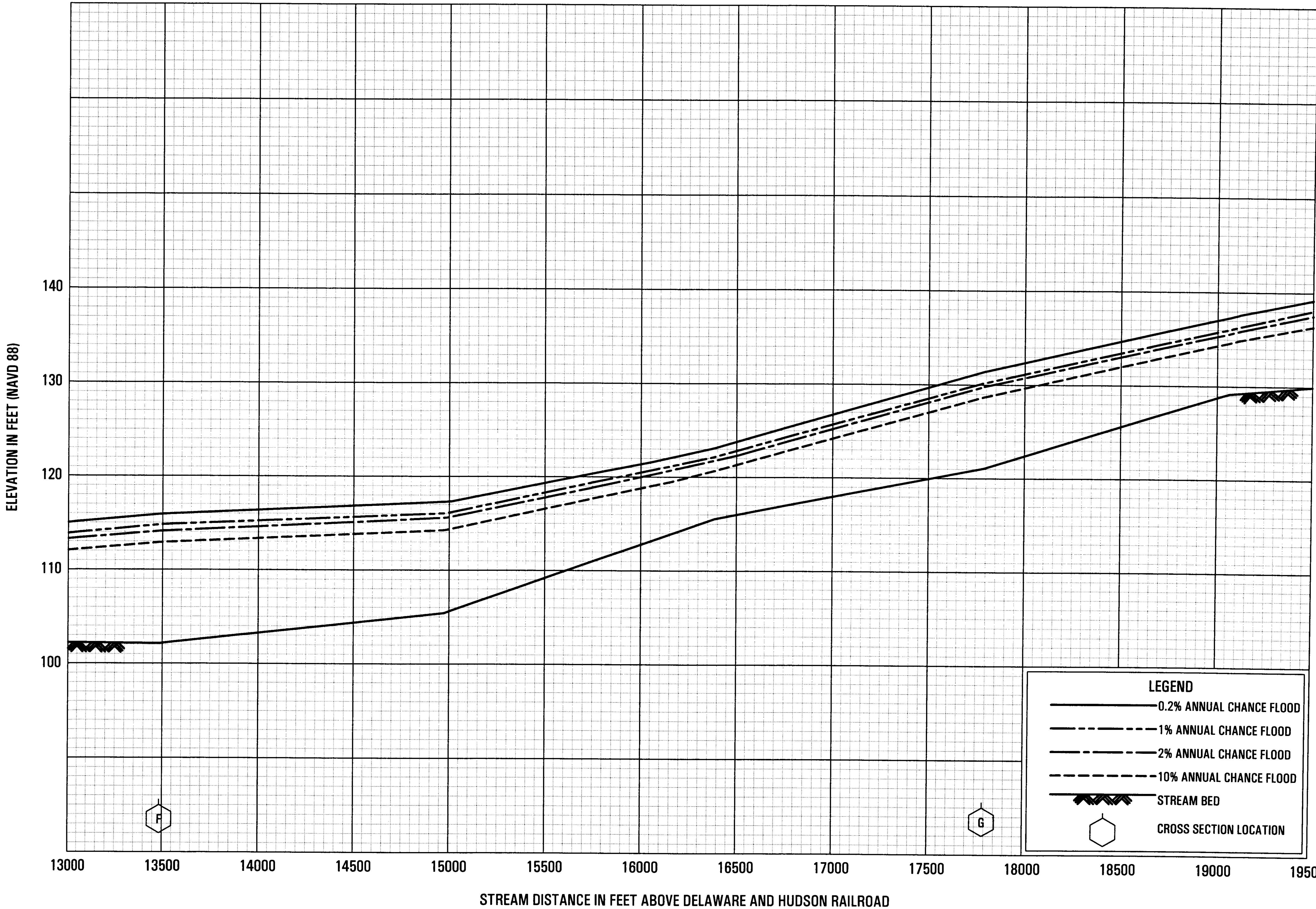

FLOOD PROFILES

LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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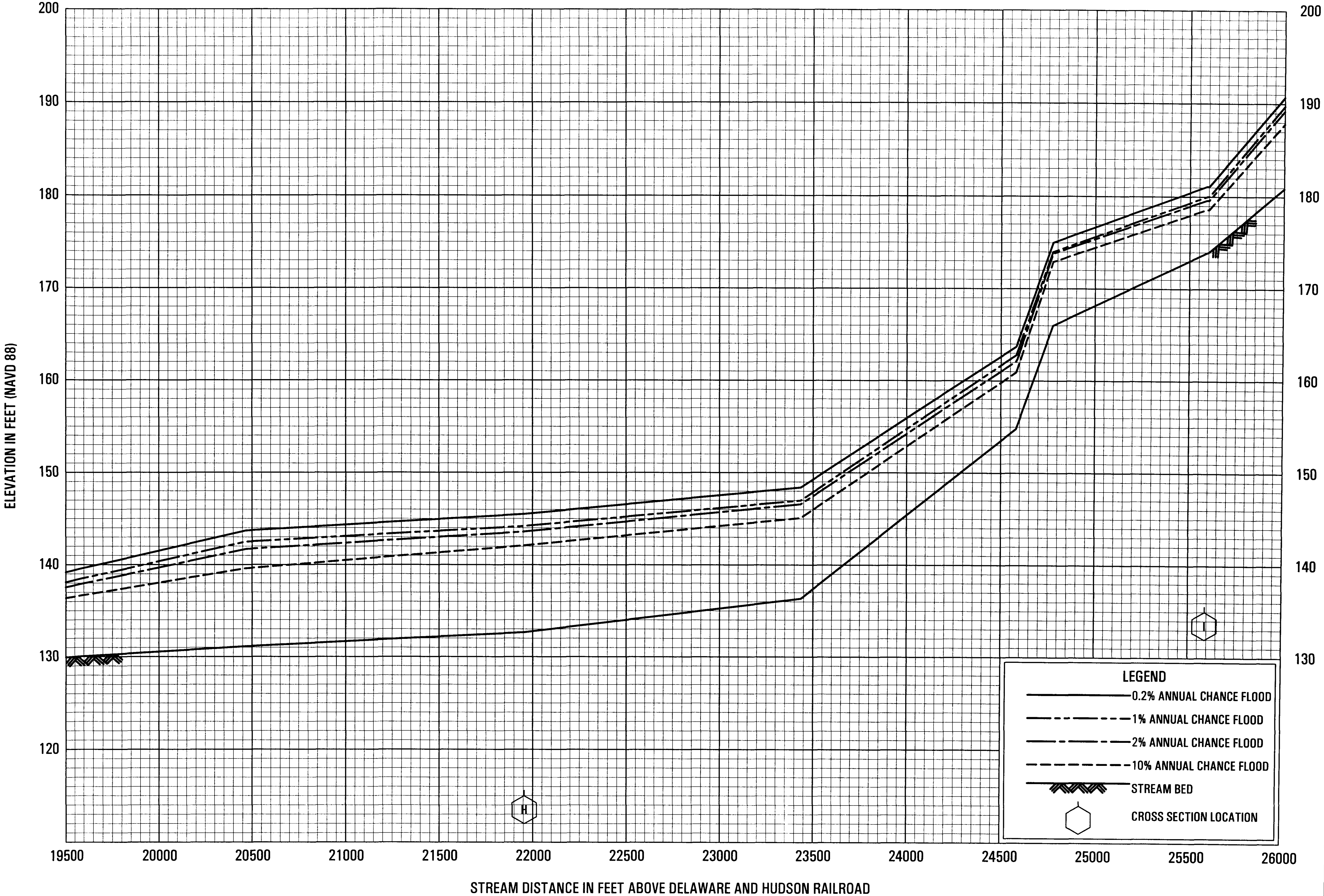


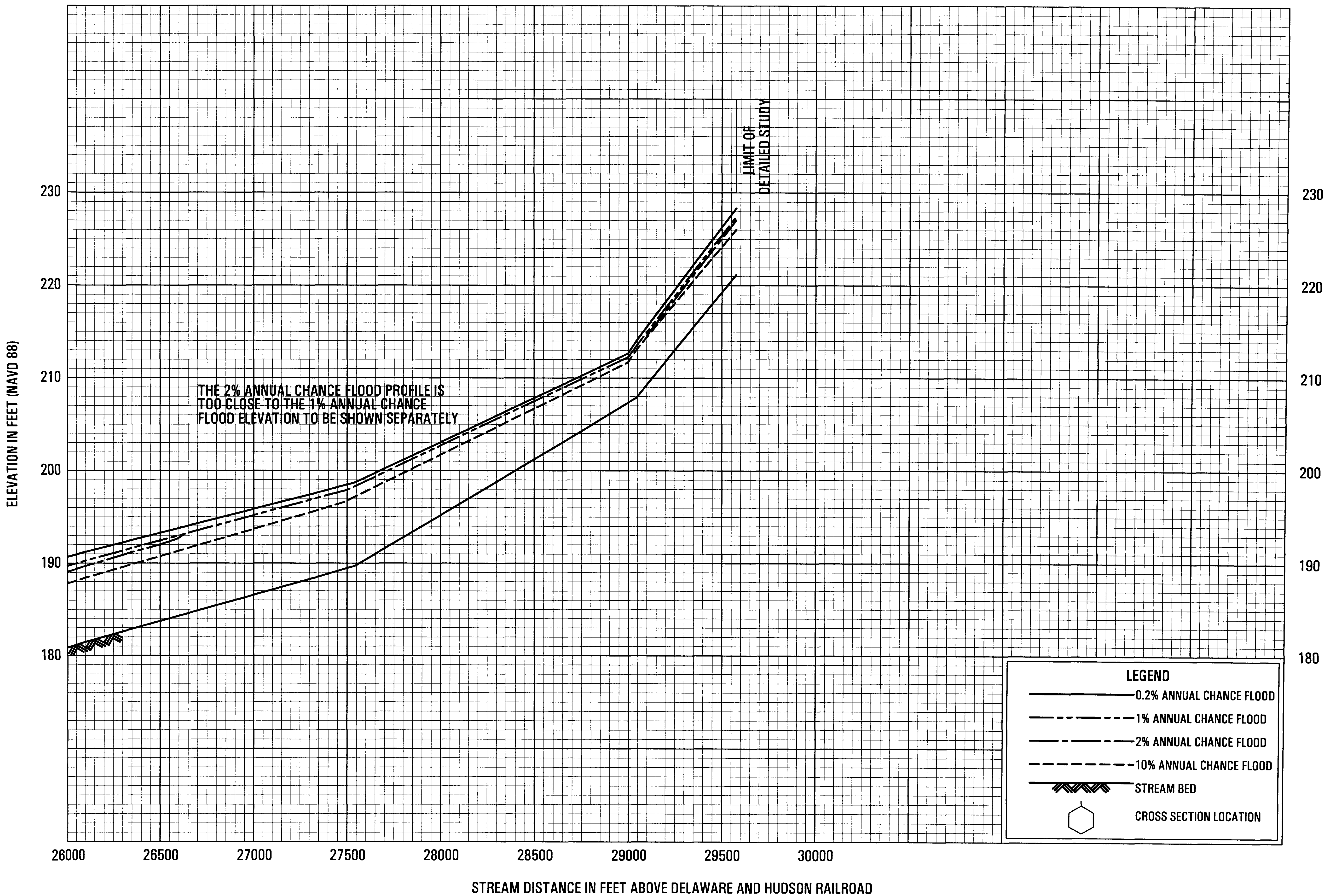
FLOOD PROFILES

LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



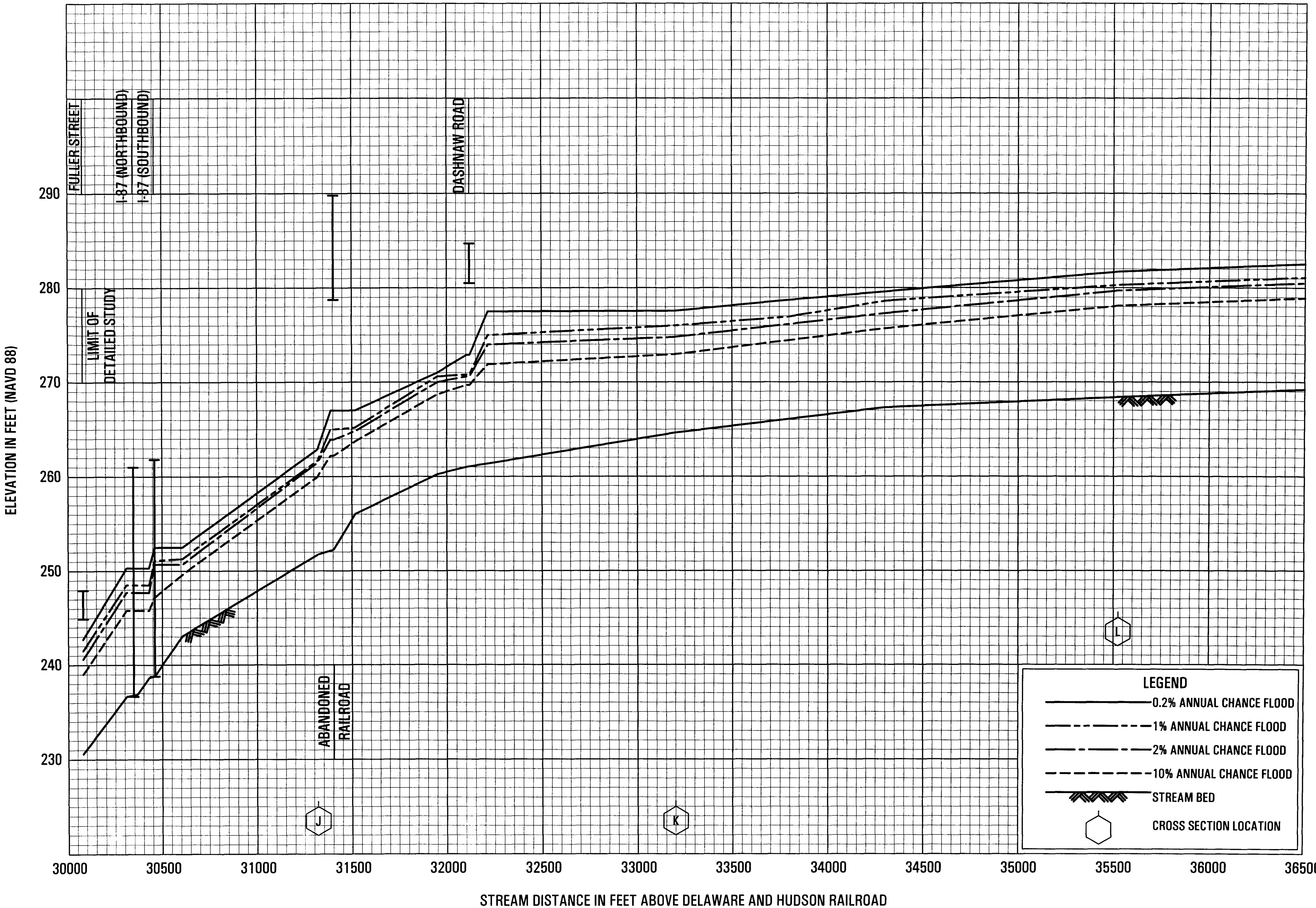
FLOOD PROFILES

LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



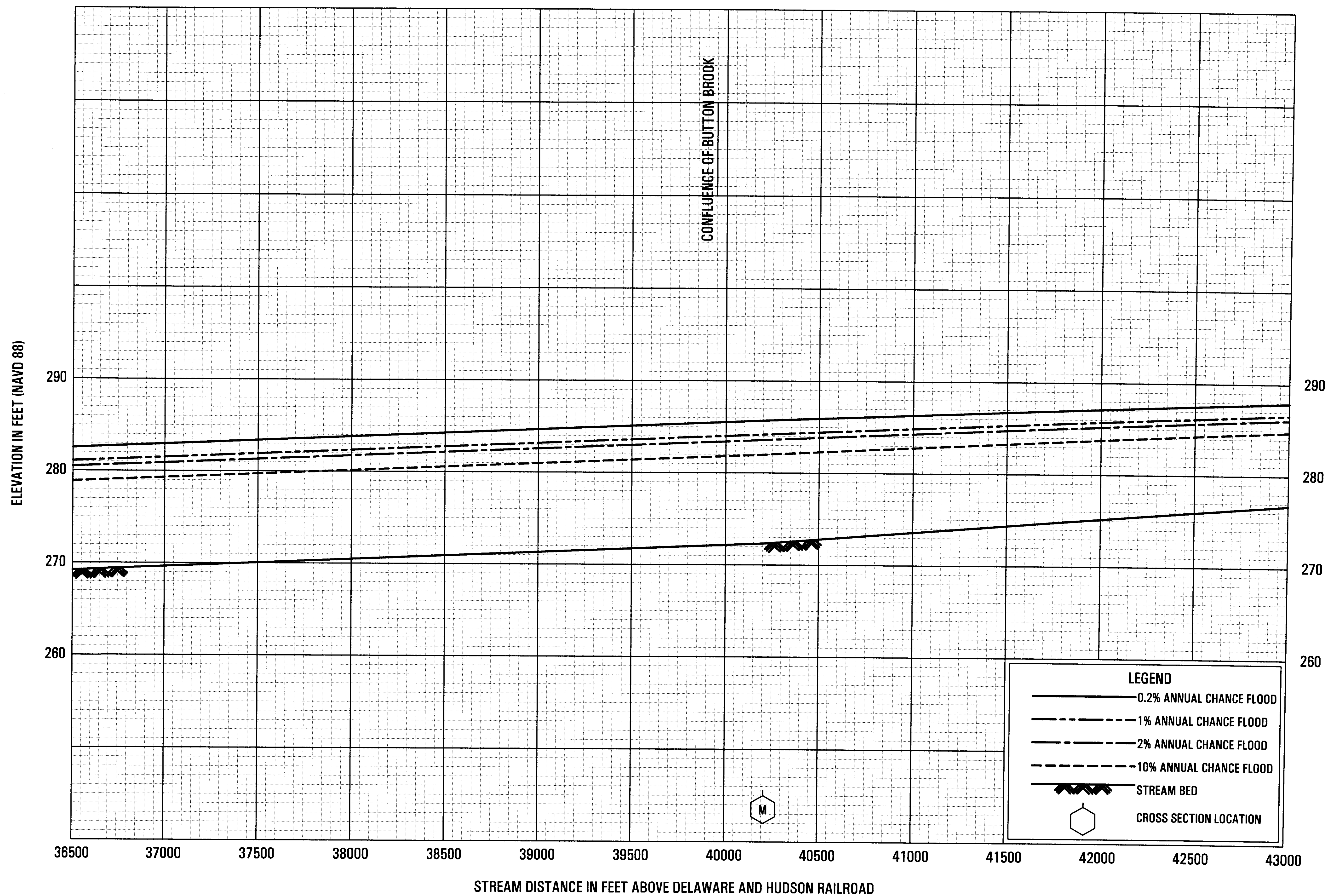
FLOOD PROFILES

LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



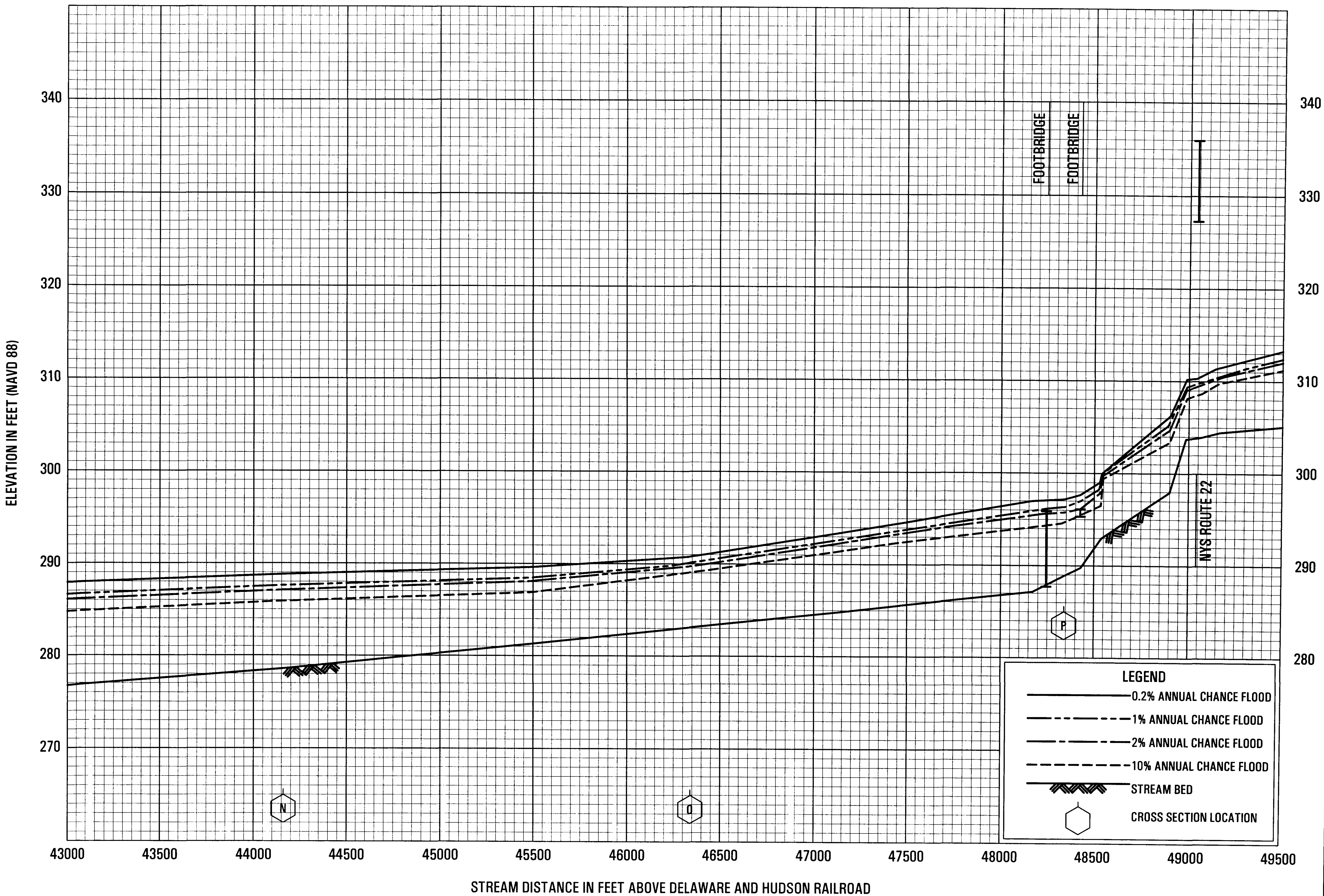
FLOOD PROFILES

LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

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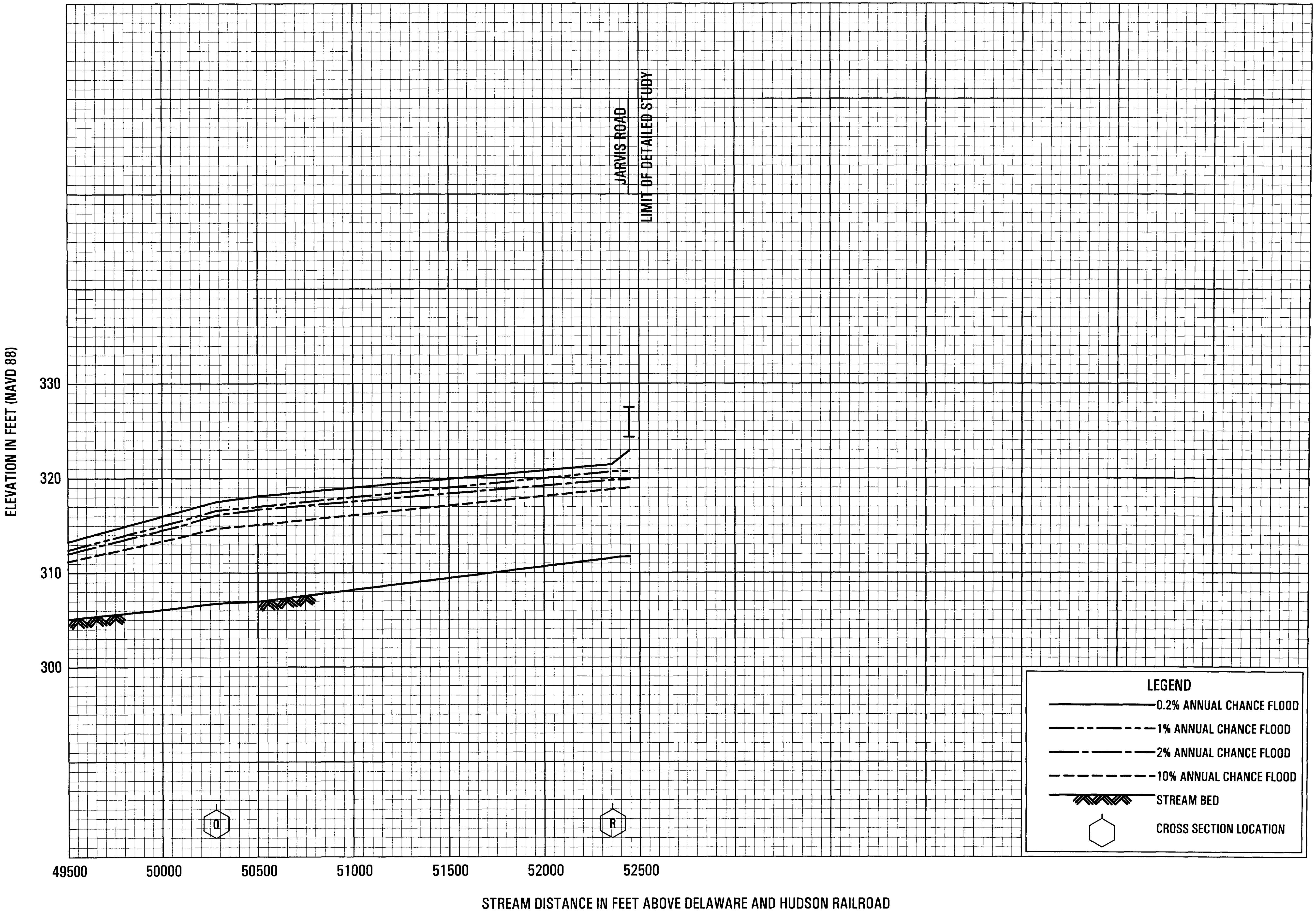


FLOOD PROFILES

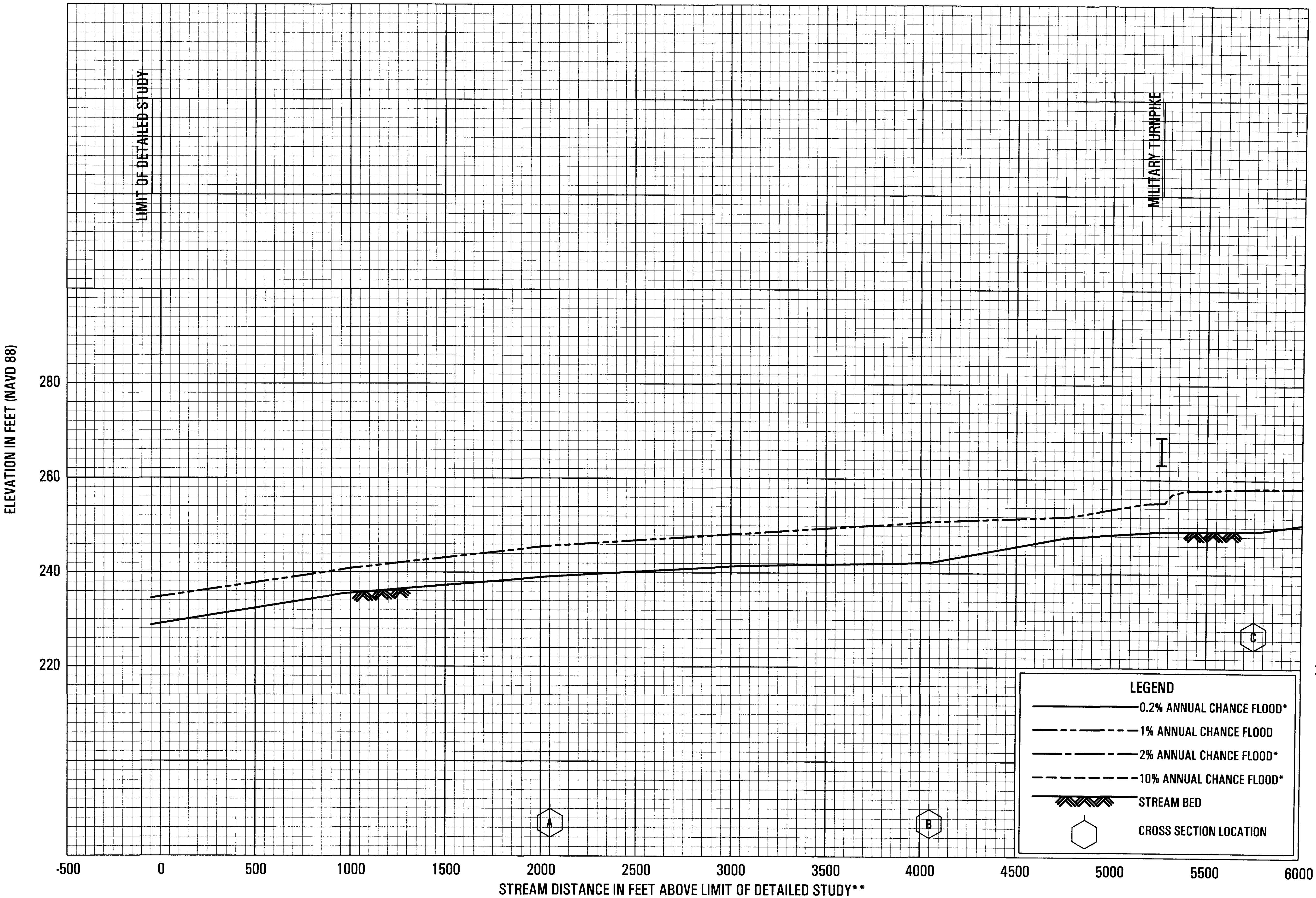
LITTLE AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

22P



**LIMIT OF DETAILED STUDY IS LOCATED APPROXIMATELY 1 MILE UPSTREAM OF INTERSTATE 87

* DATA NOT AVAILABLE

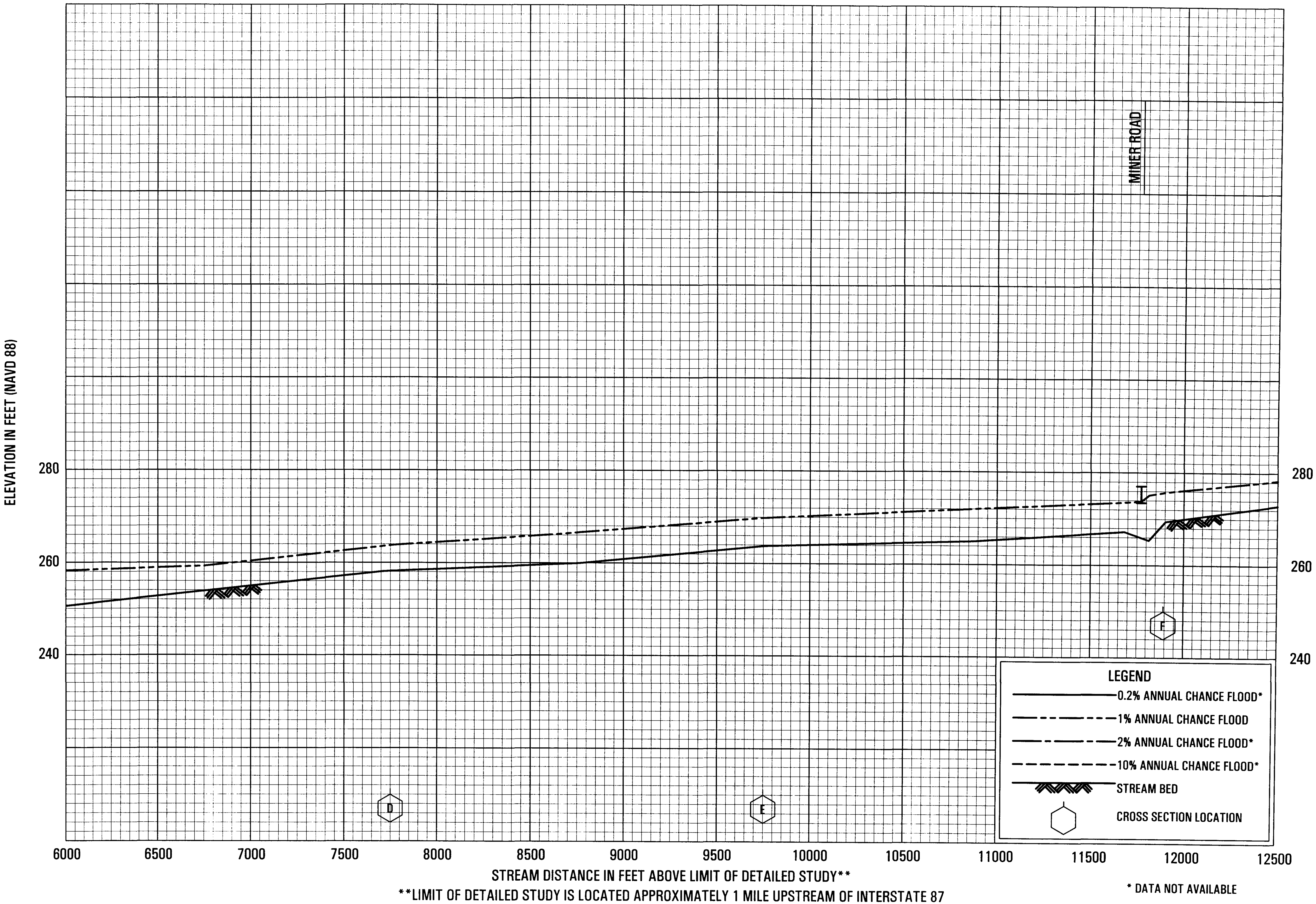
FLOOD PROFILES

SALMON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

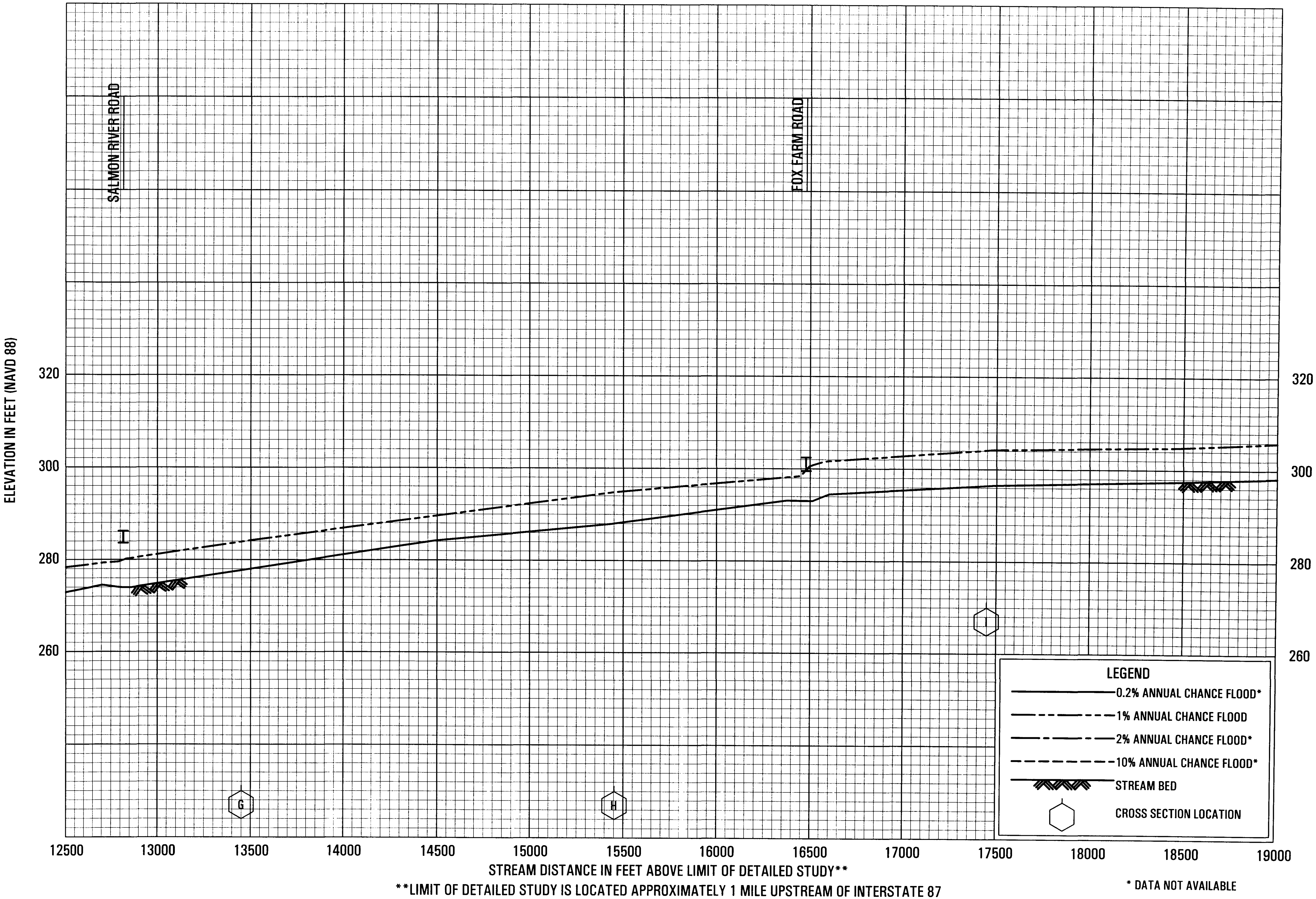
SALMON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

24P



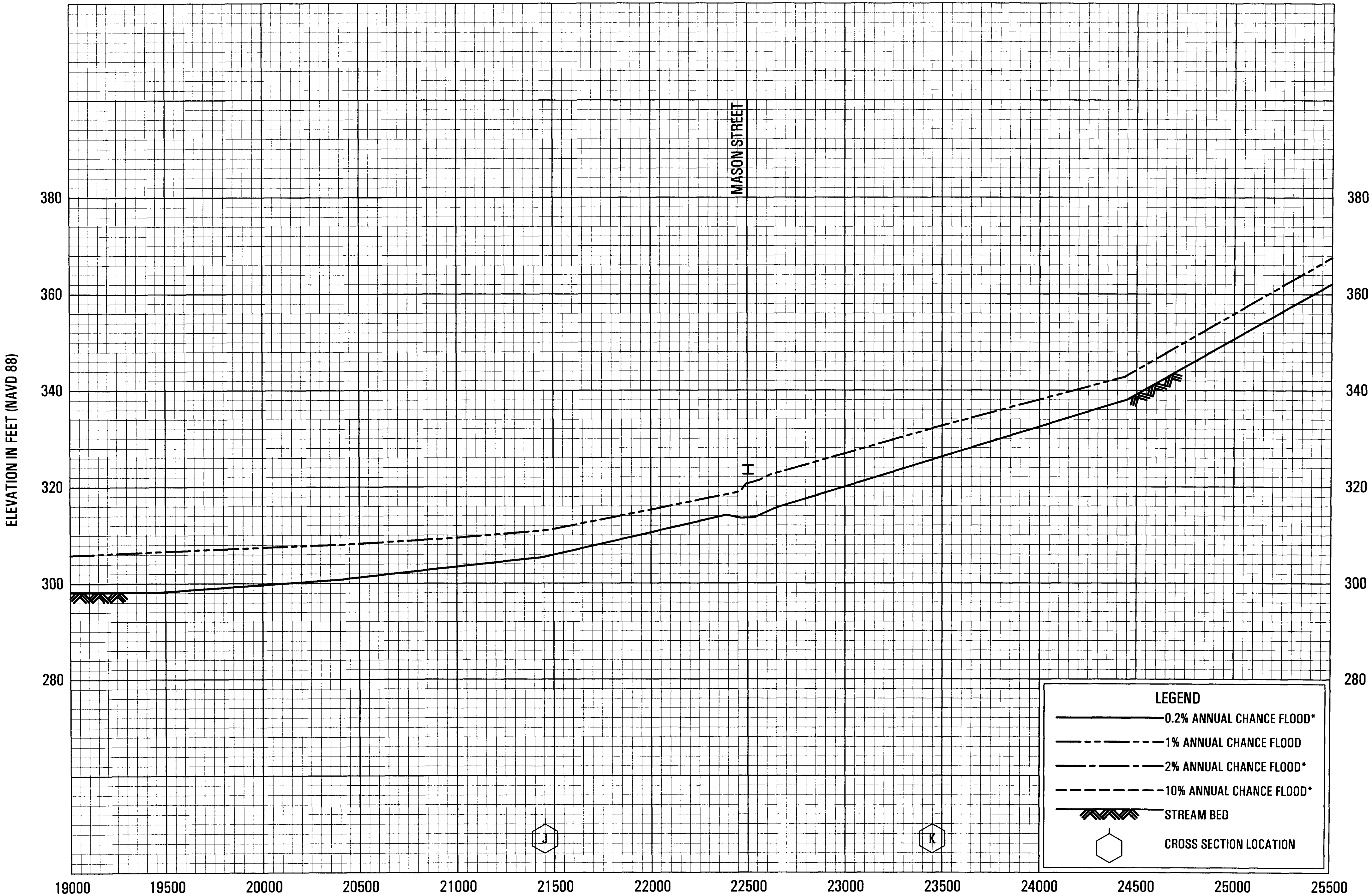
FLOOD PROFILES

SALMON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



STREAM DISTANCE IN FEET ABOVE LIMIT OF DETAILED STUDY**

**LIMIT OF DETAILED STUDY IS LOCATED APPROXIMATELY 1 MILE UPSTREAM OF INTERSTATE 87

* DATA NOT AVAILABLE

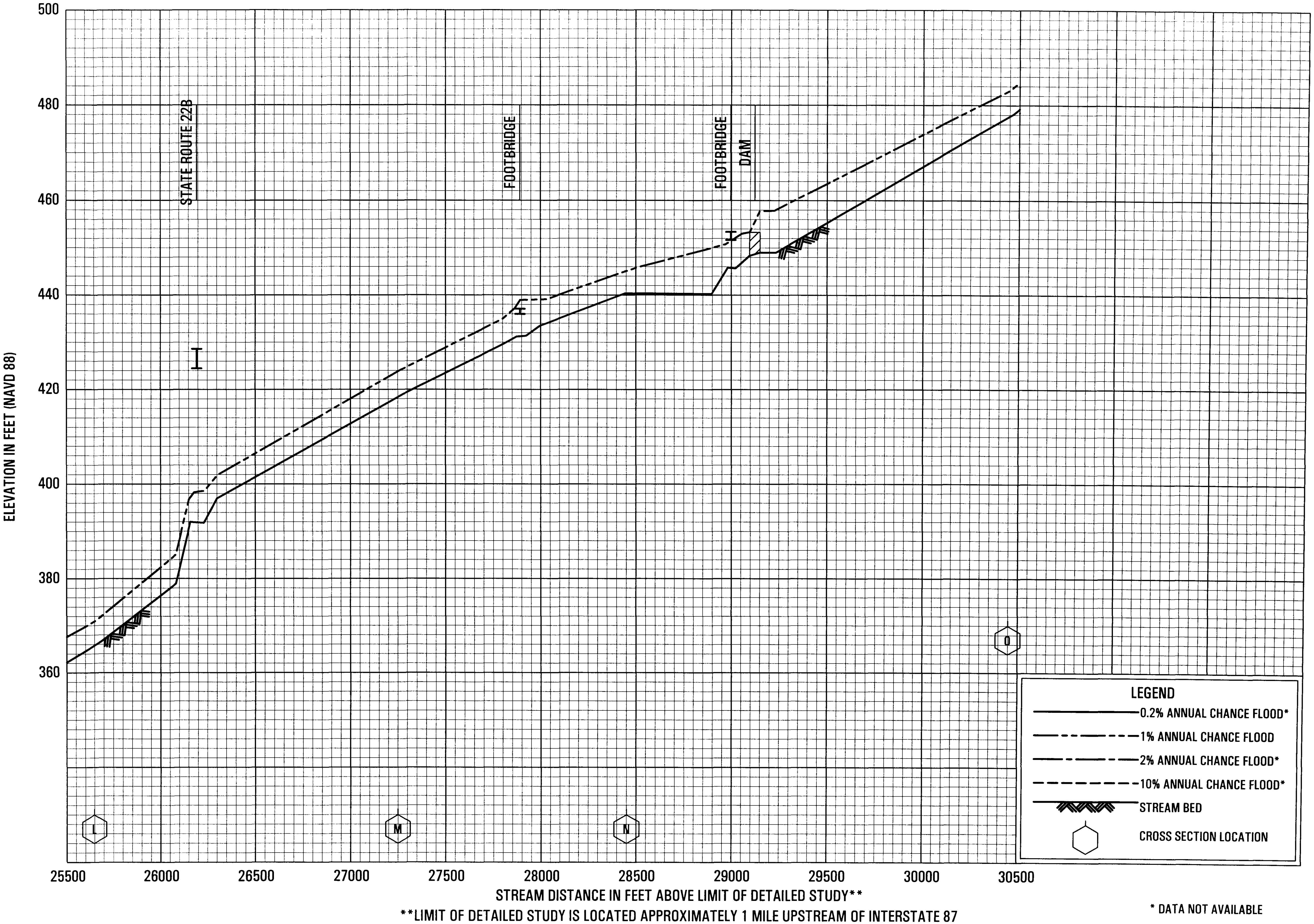
FLOOD PROFILES

SALMON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

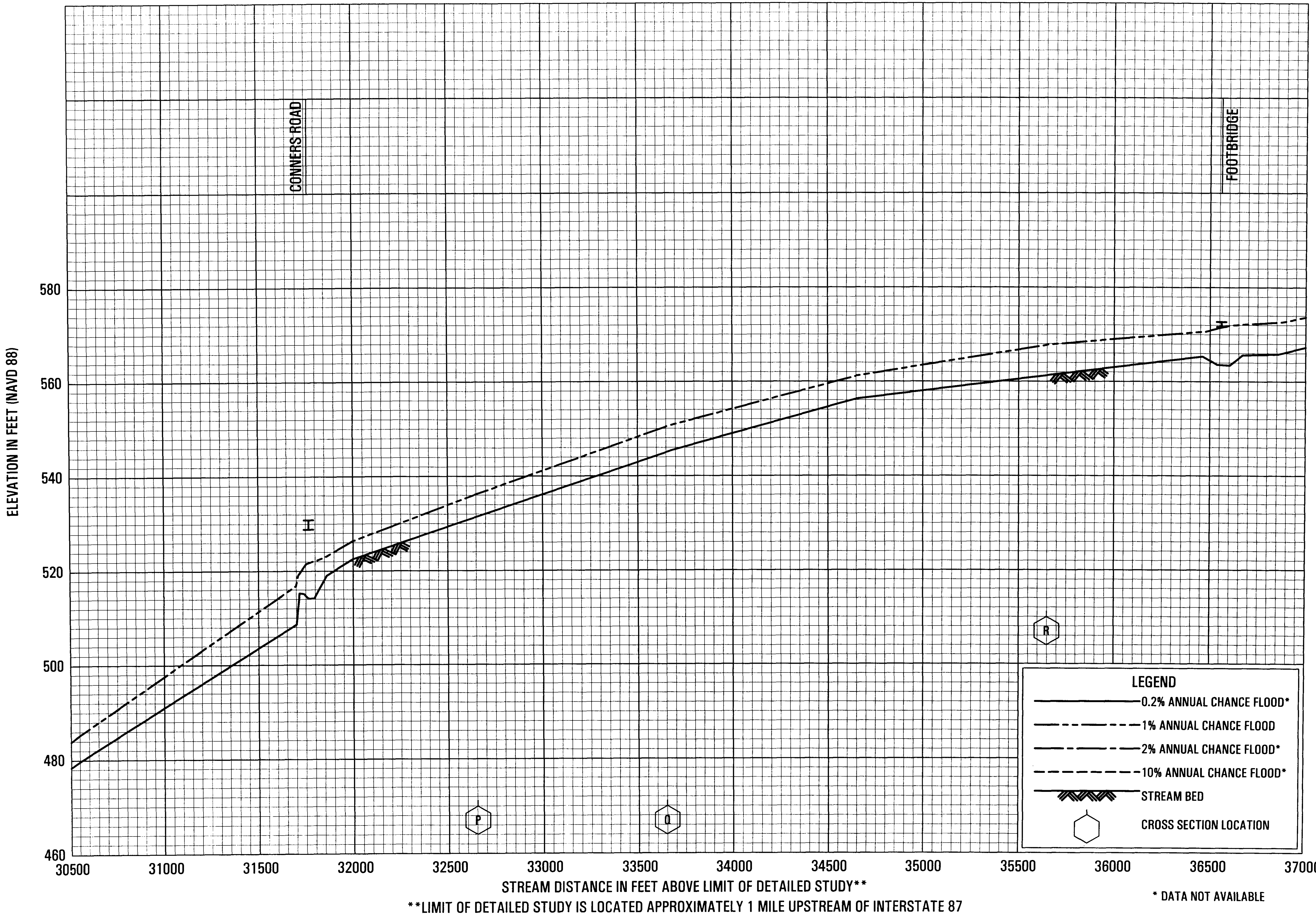
SALMON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

27P



FLOOD PROFILES

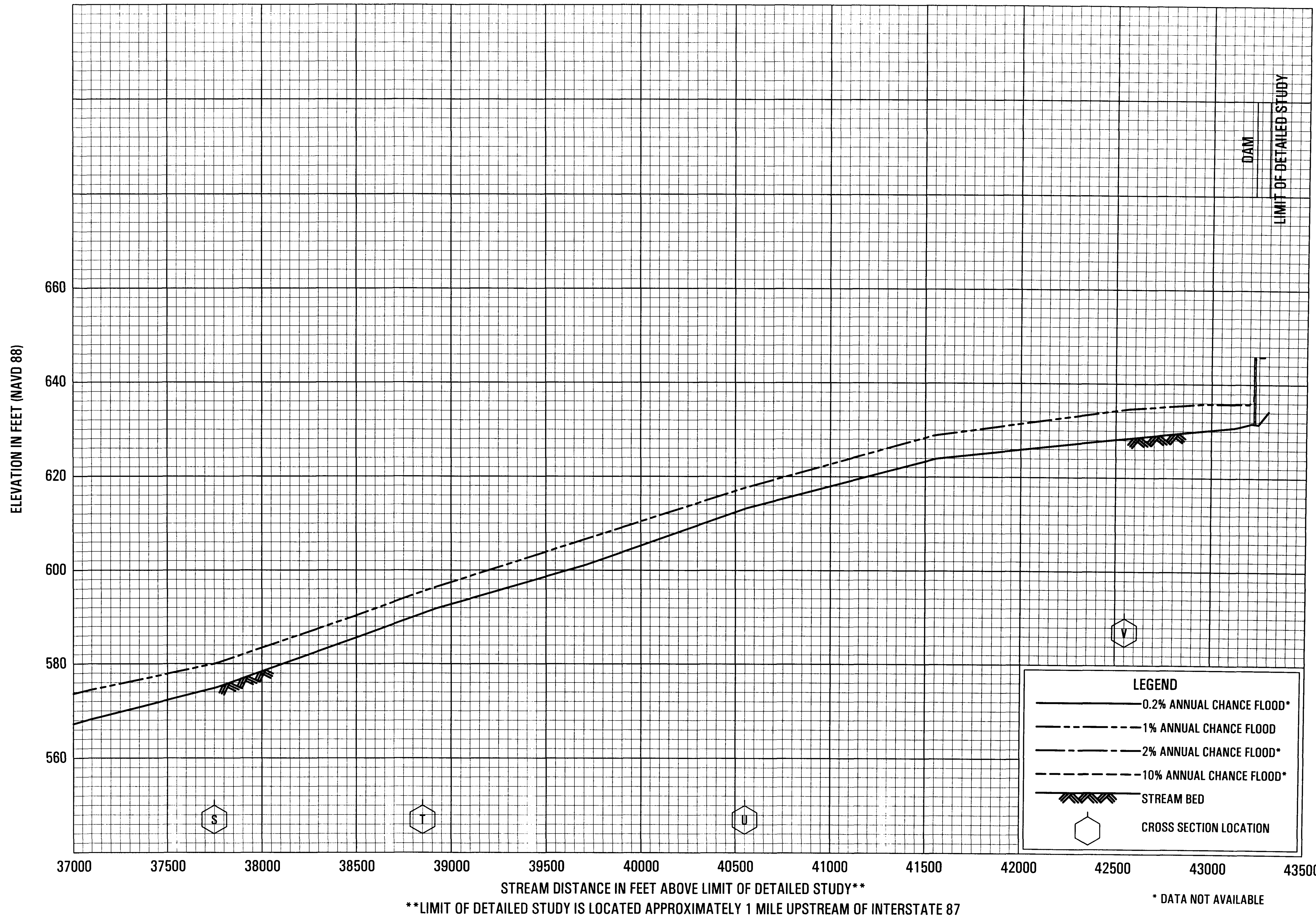
SALMON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)

28P



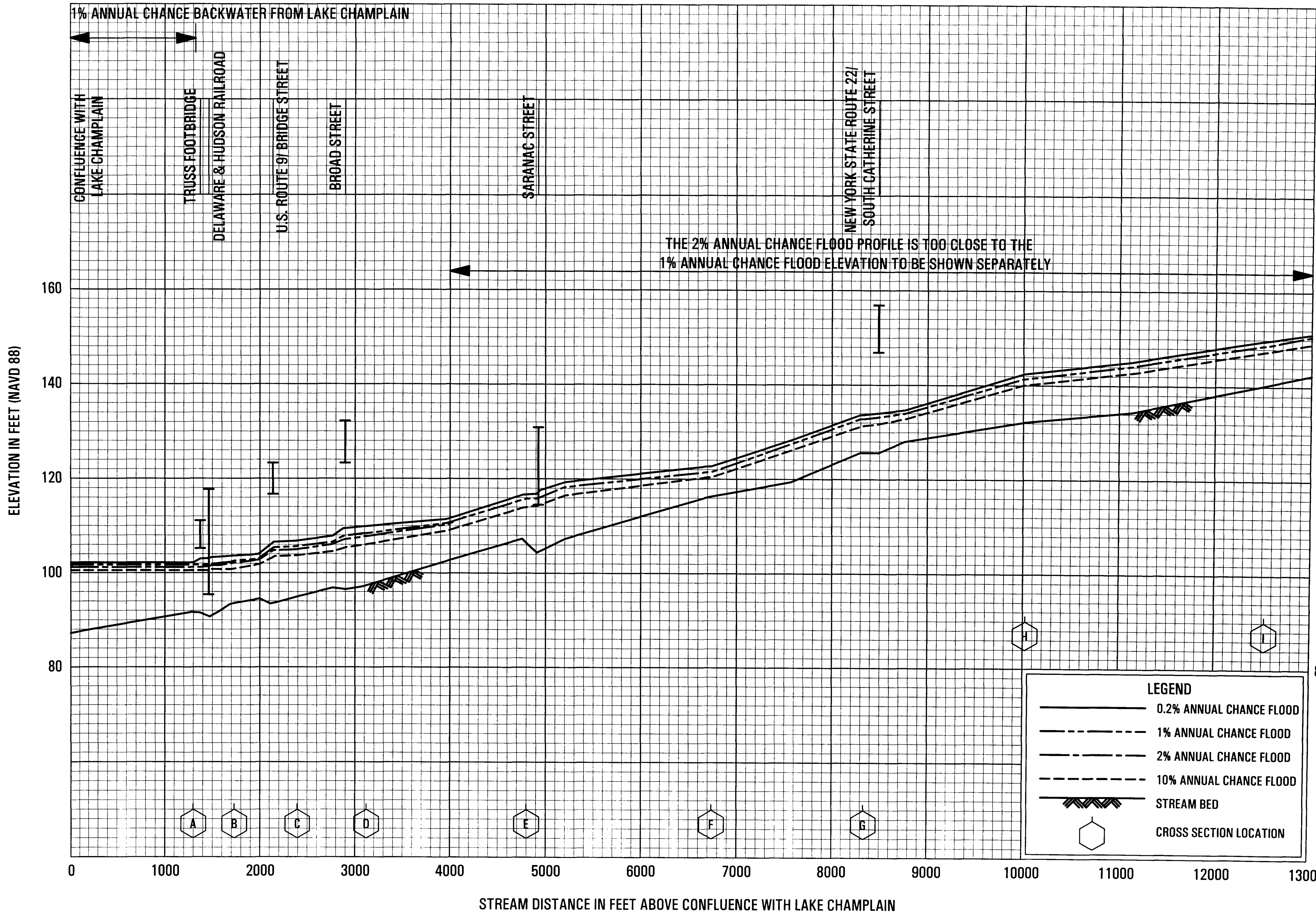
FLOOD PROFILES

SALMON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)



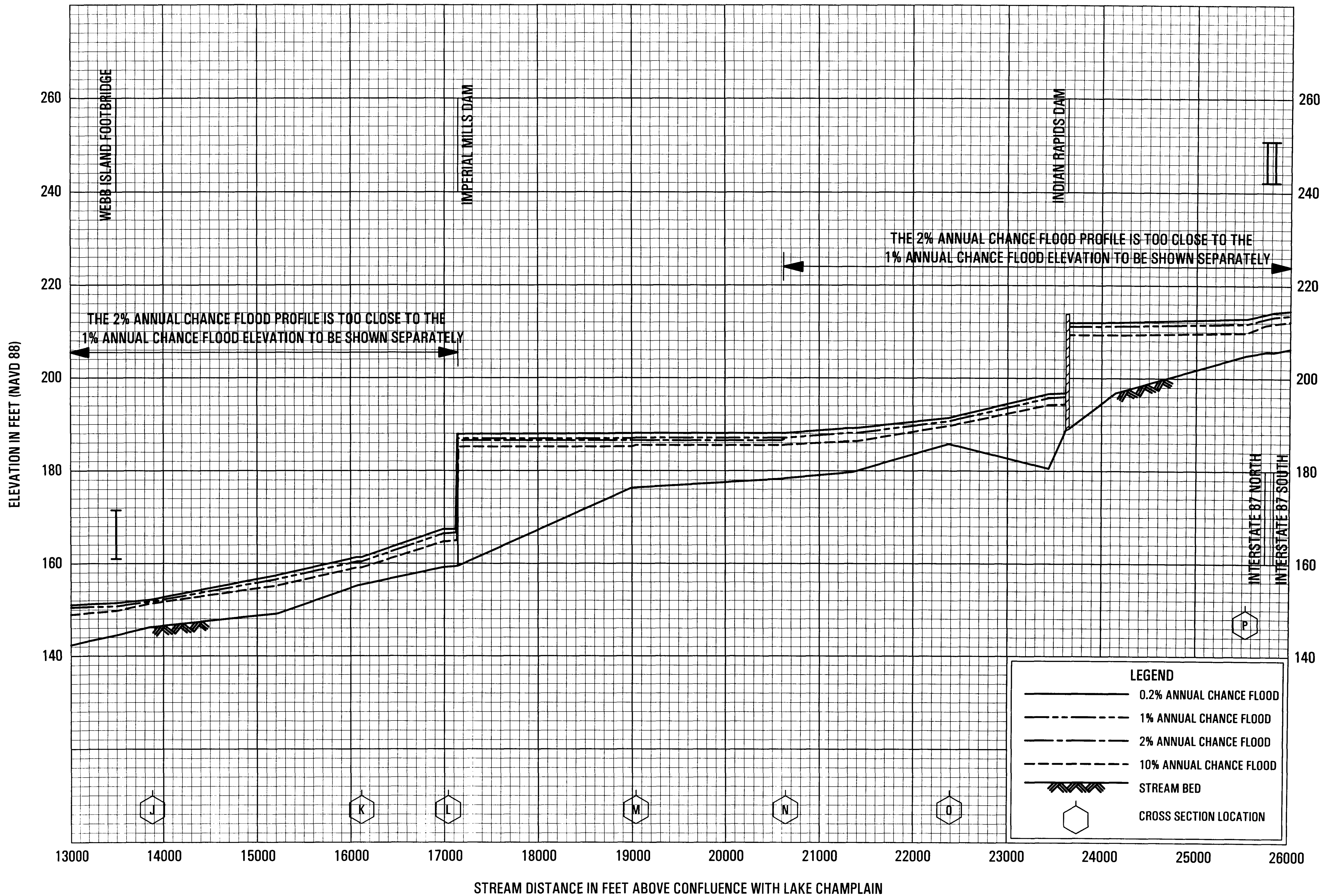
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



FLOOD PROFILES

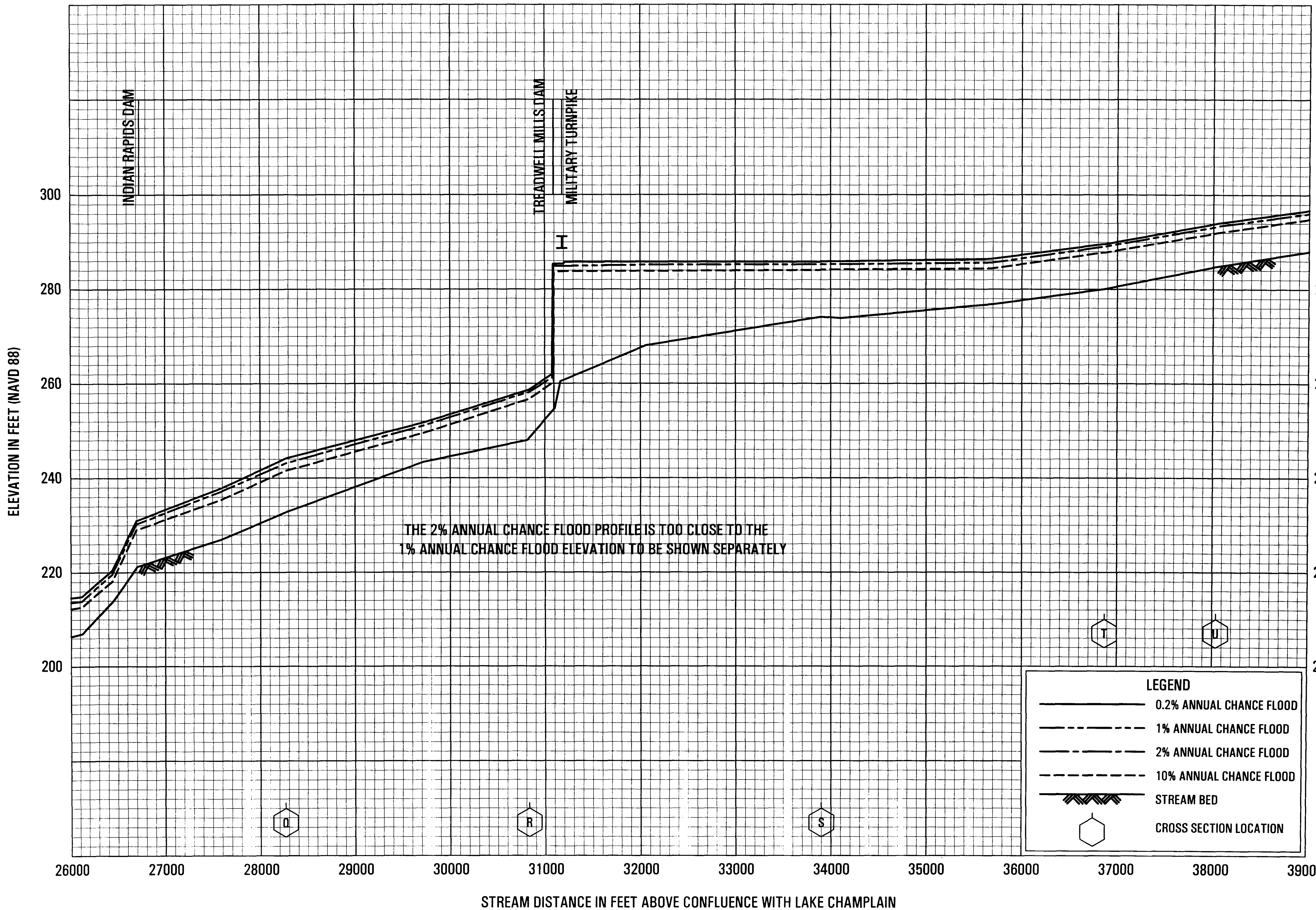
SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS

31P



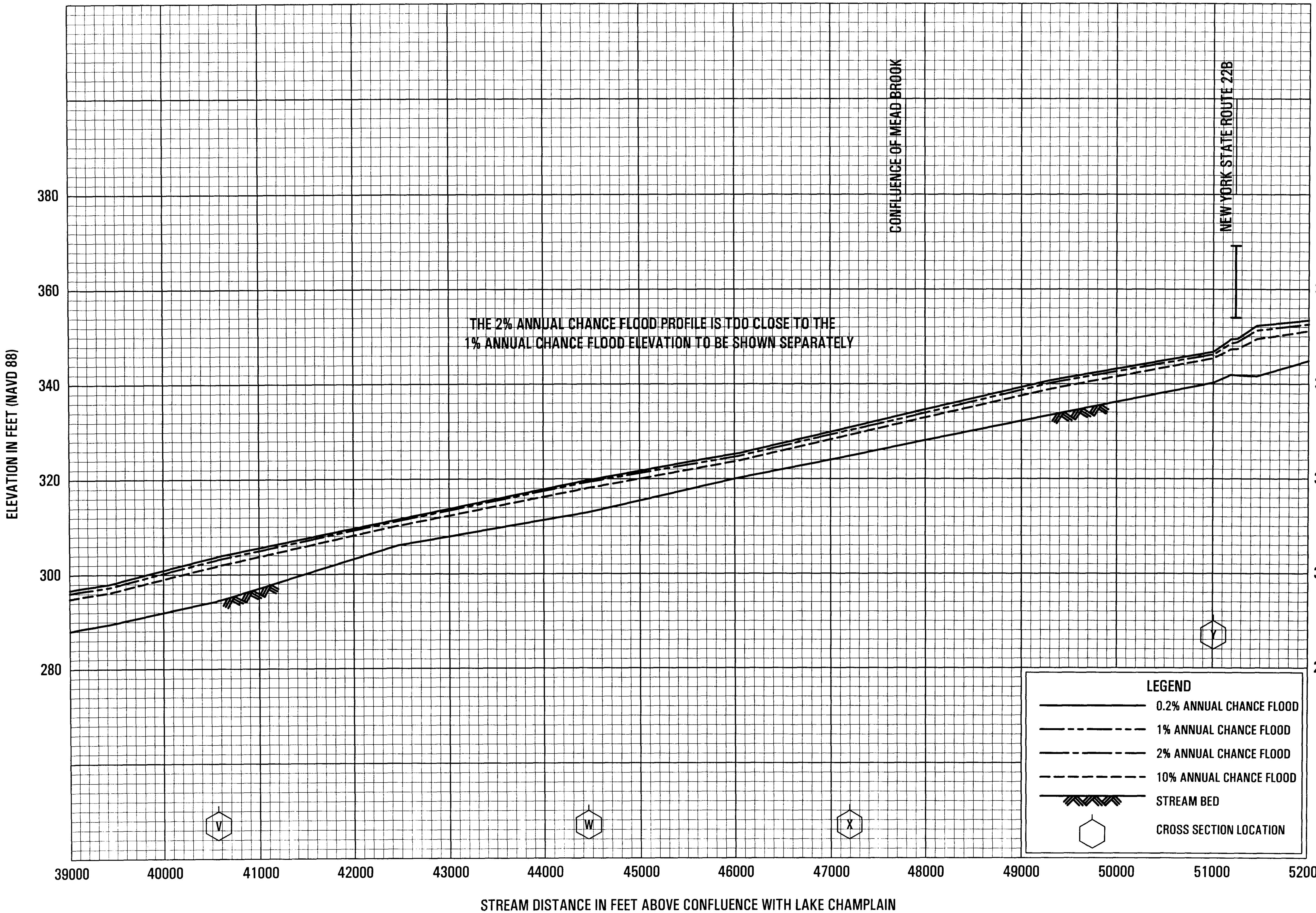
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



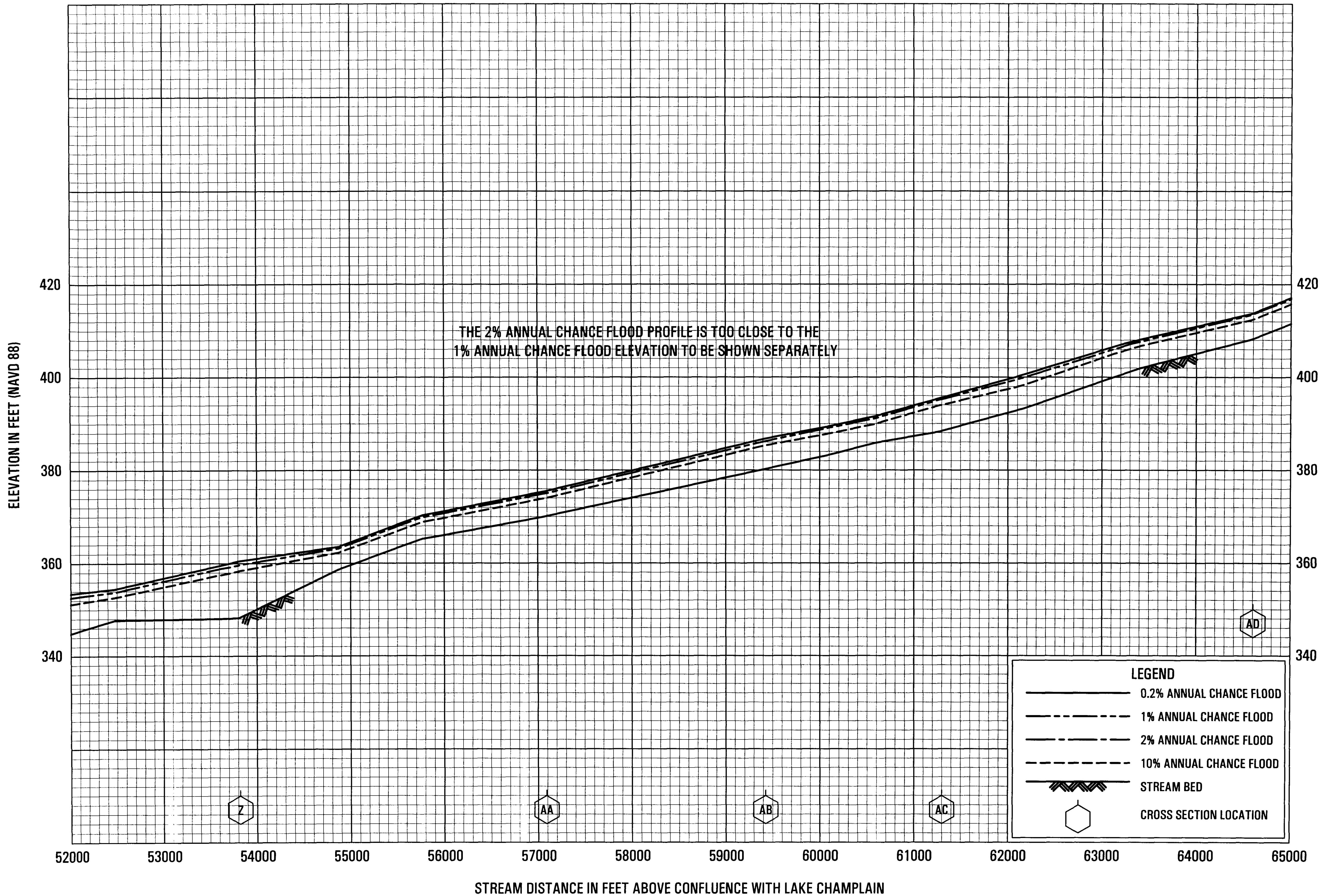
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



FLOOD PROFILES

SARANAC RIVER

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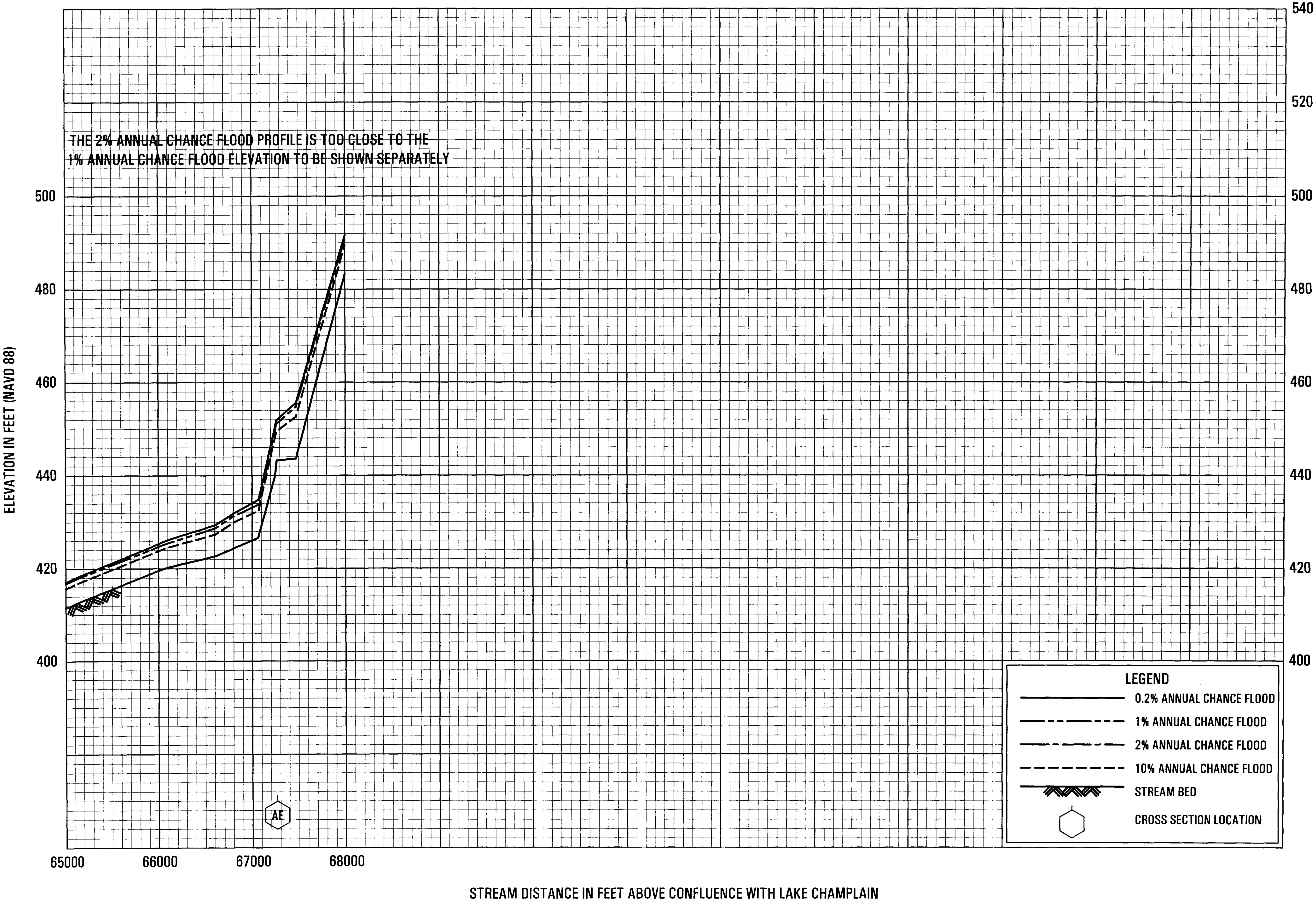
CLINTON COUNTY, NY

ALL JURISDICTIONS



FLOOD PROFILES

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CLINTON COUNTY, NY

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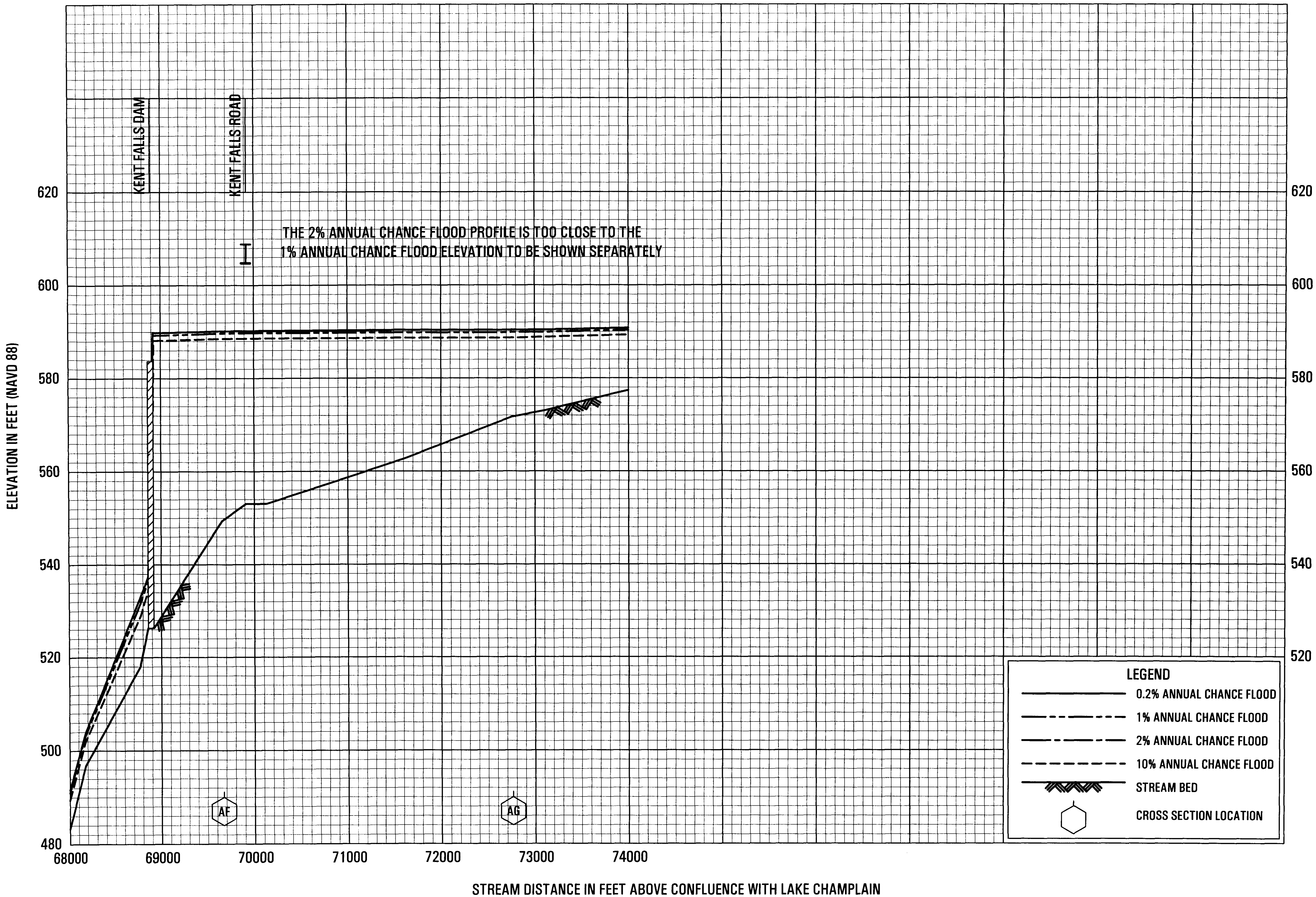

FLOOD PROFILES

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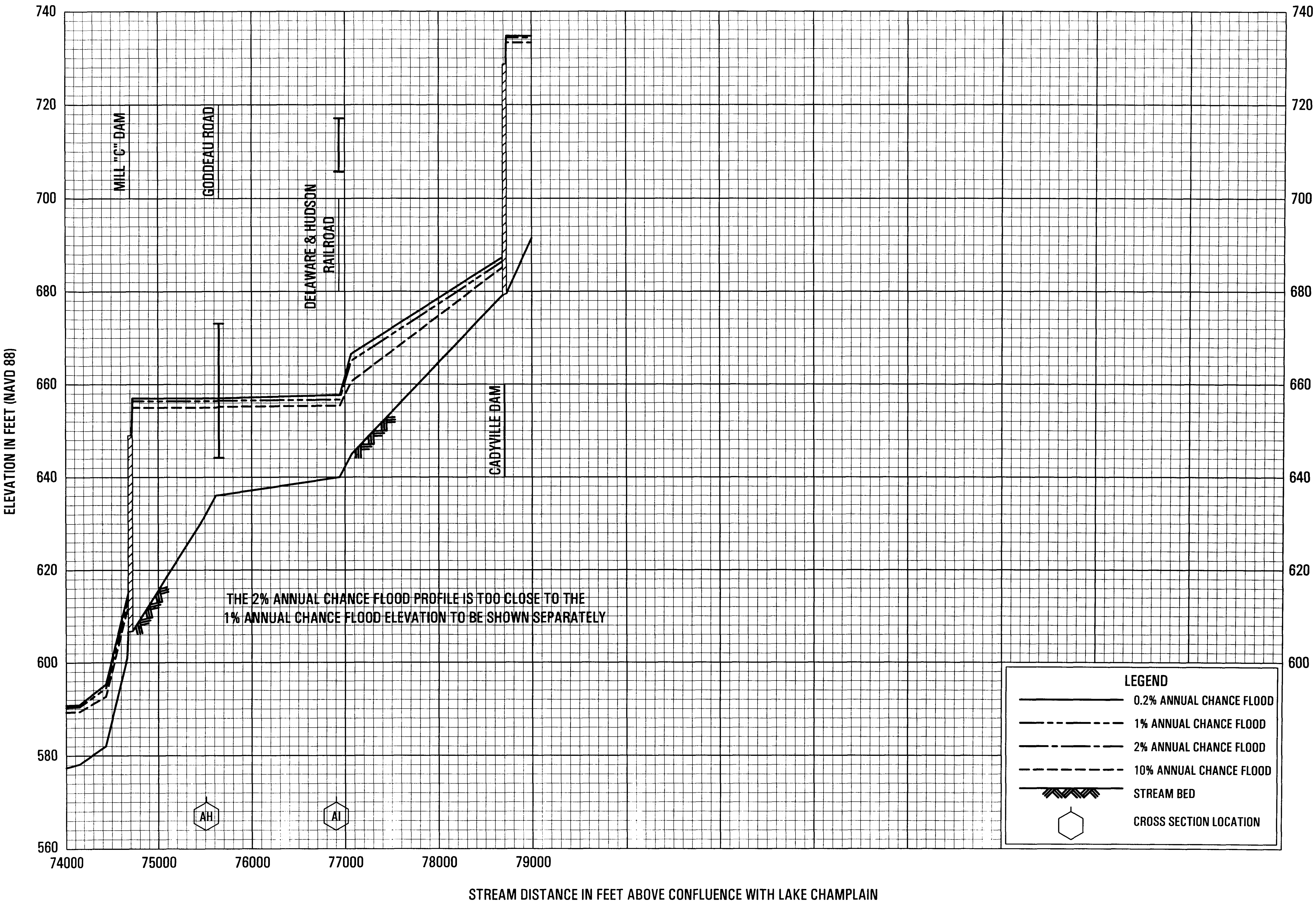
CLINTON COUNTY, NY

ALL JURISDICTIONS



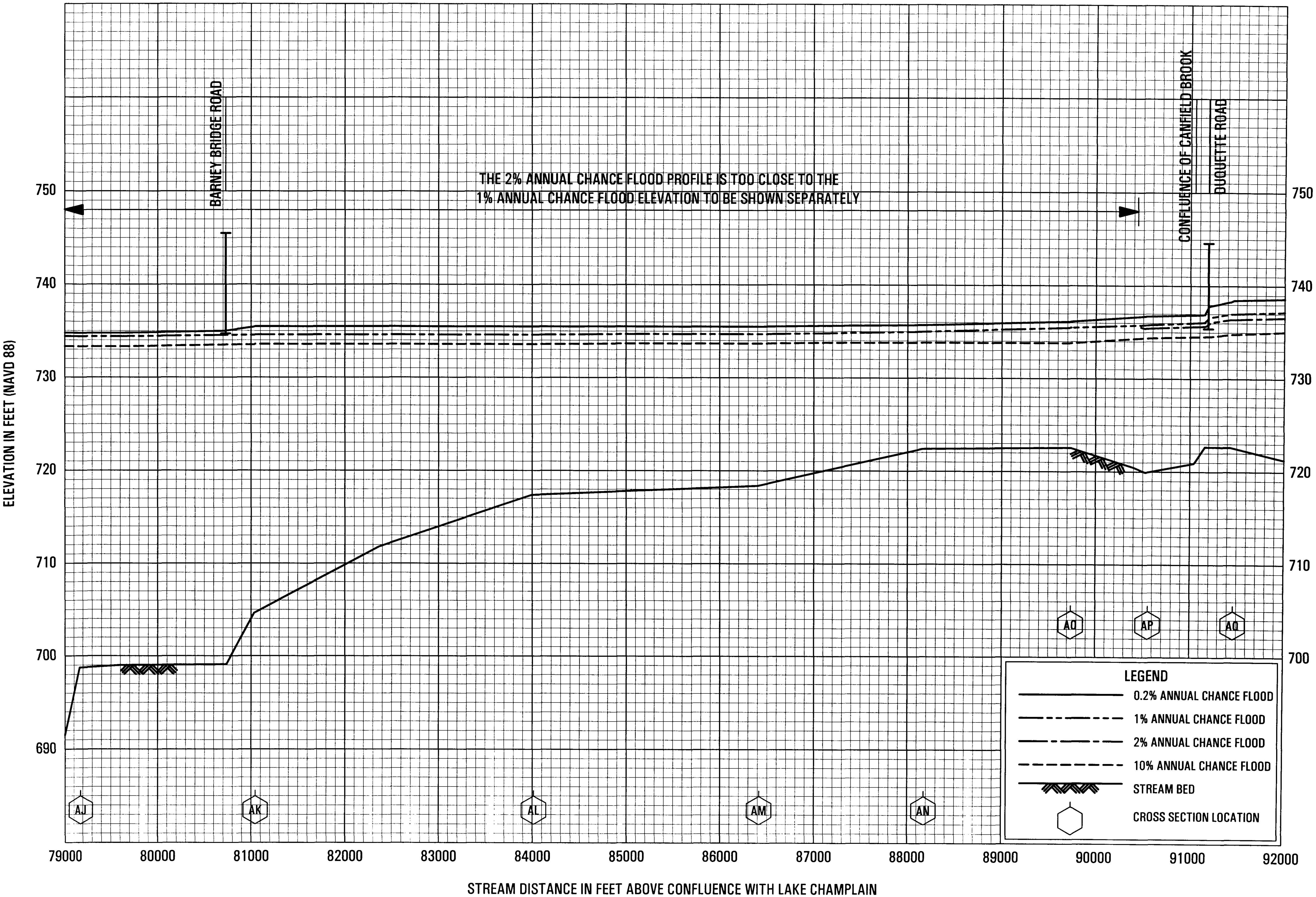
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



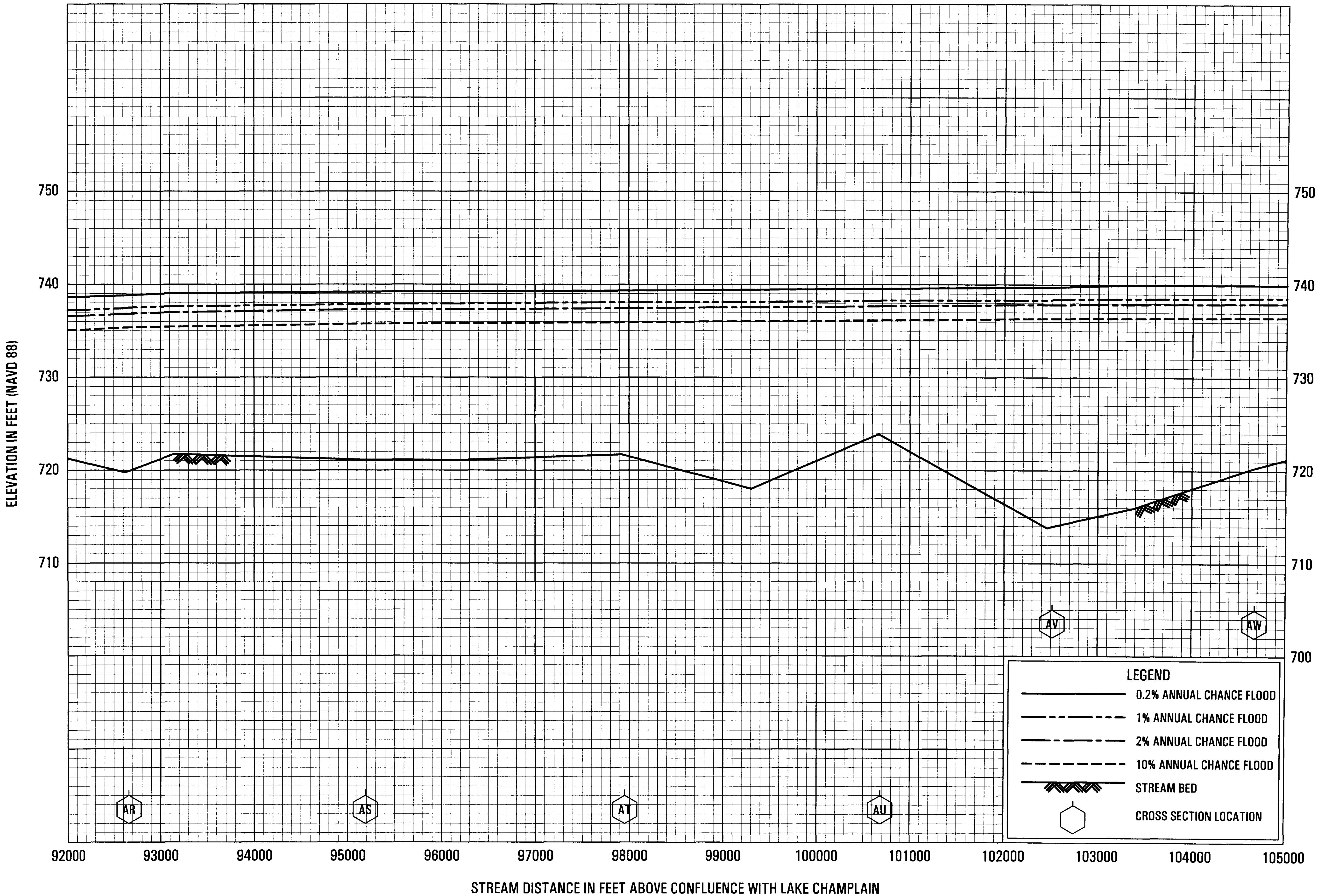
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



FLOOD PROFILES

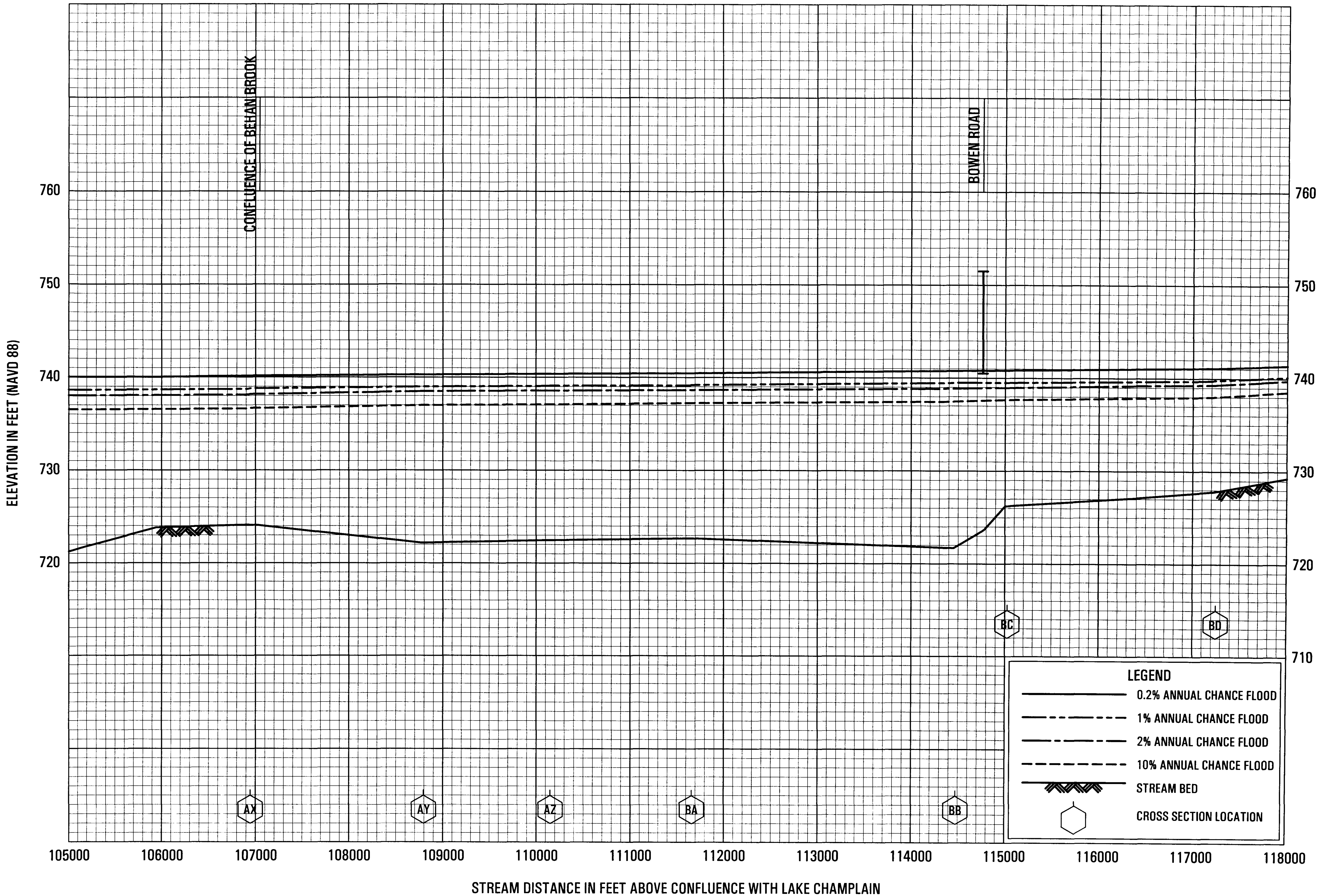
SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS

39P



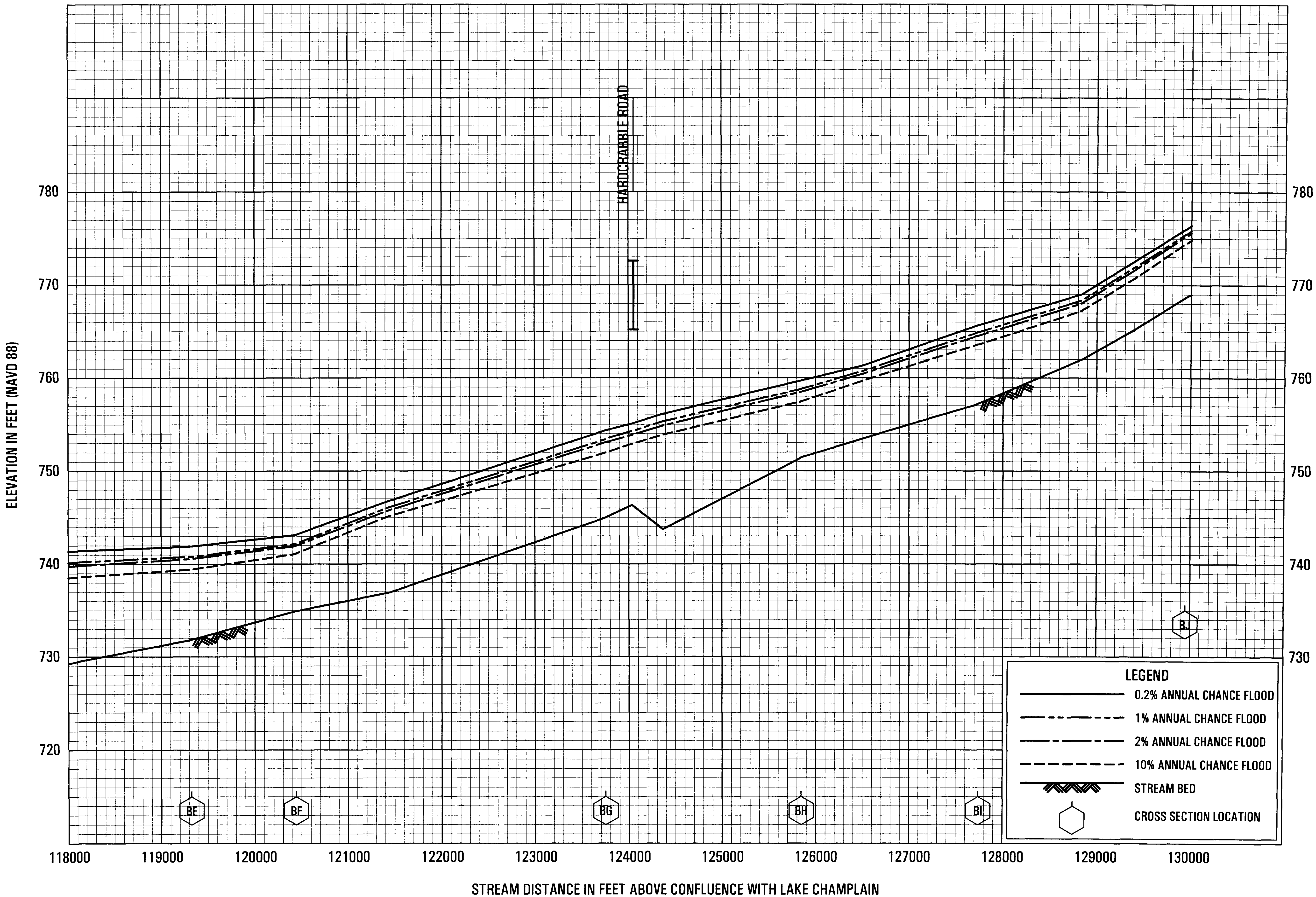
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



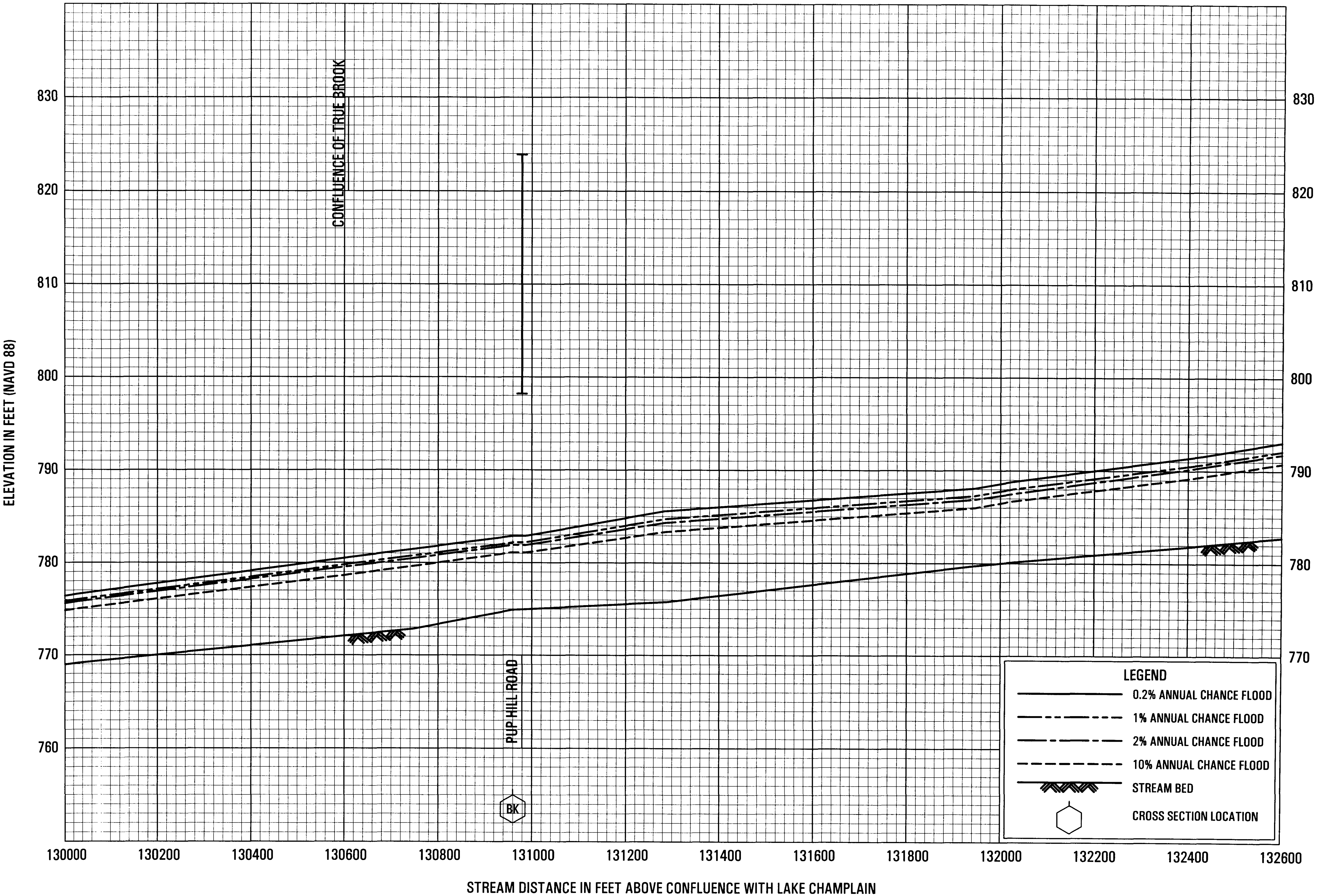
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



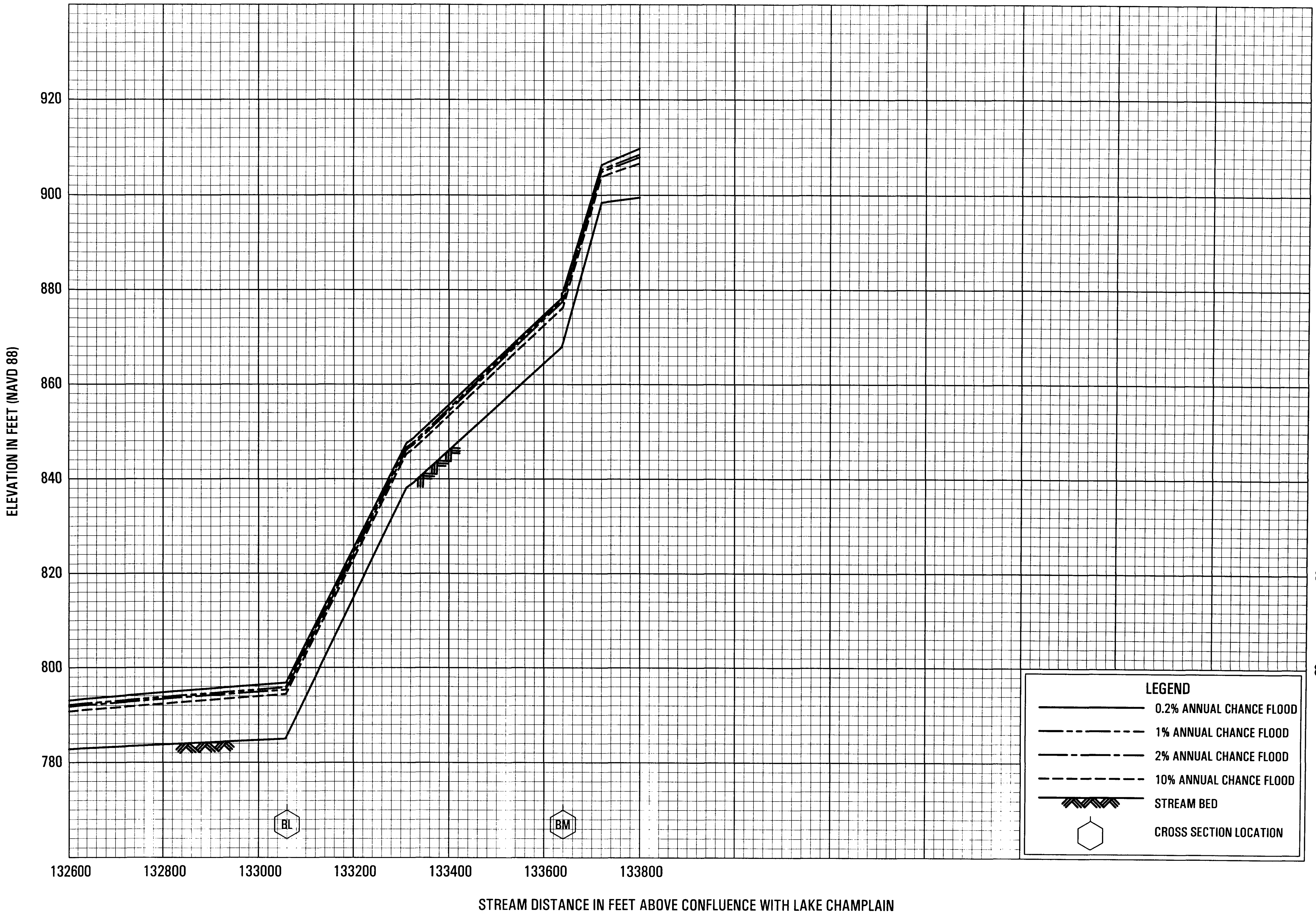
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



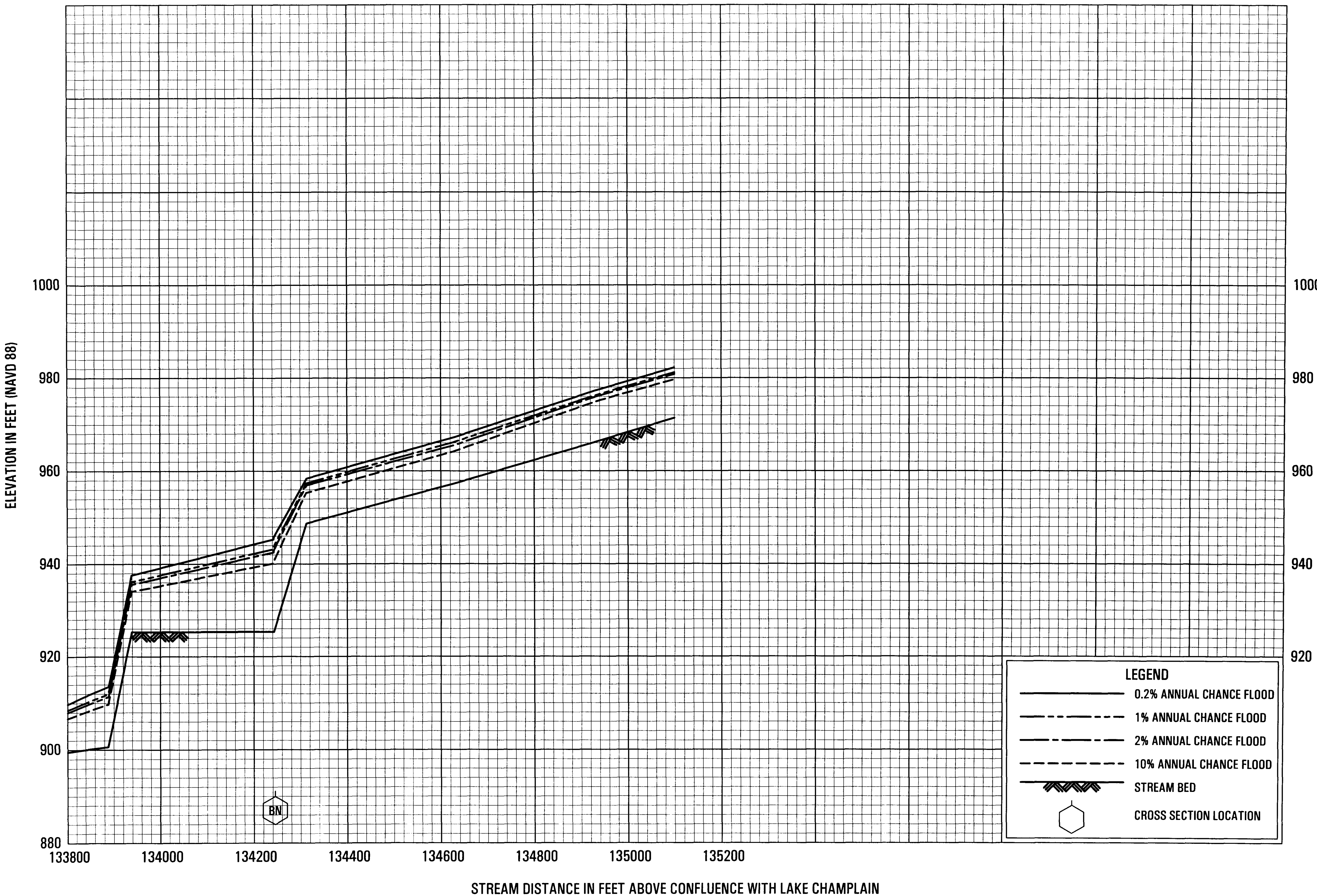
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



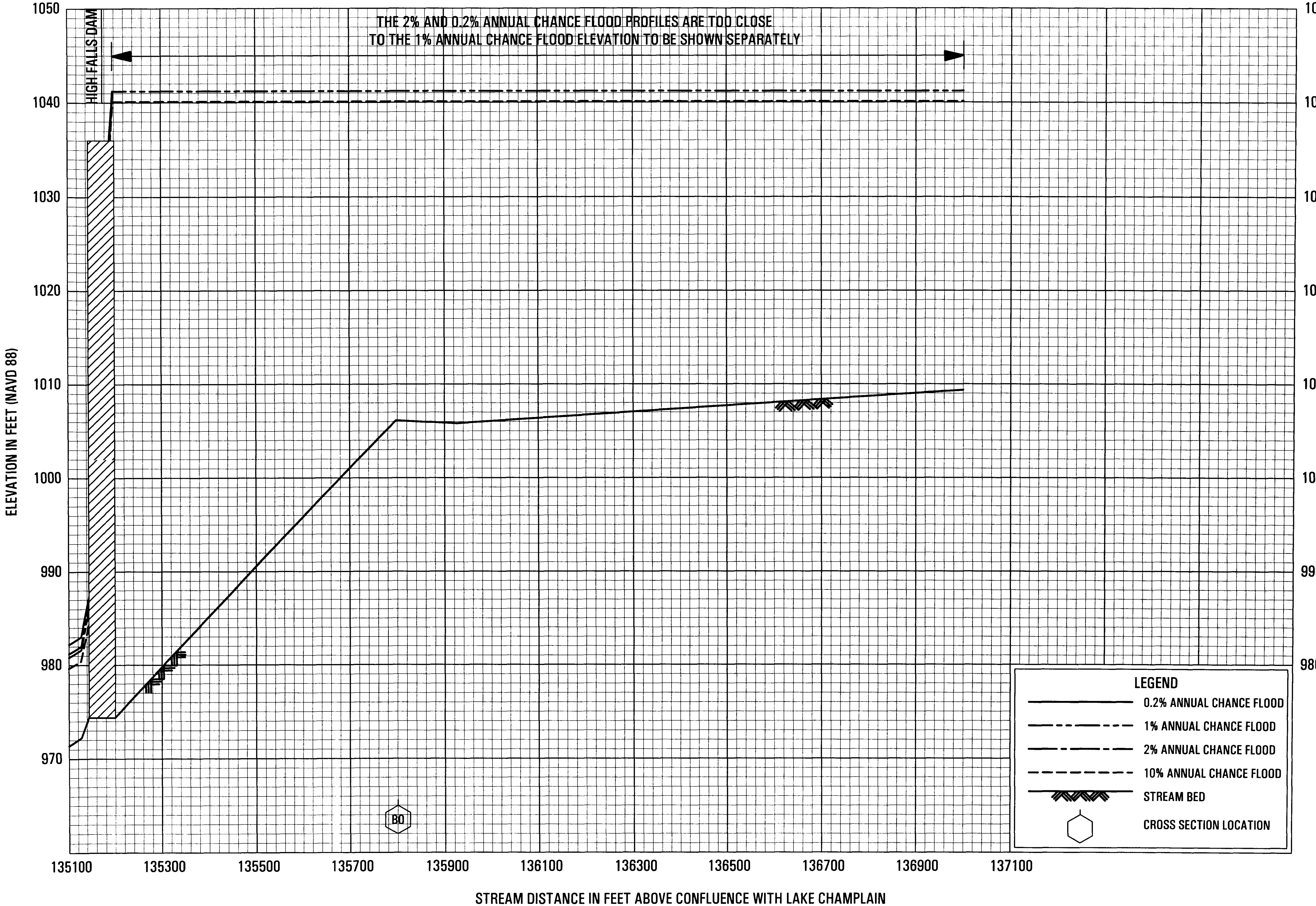
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



FLOOD PROFILES

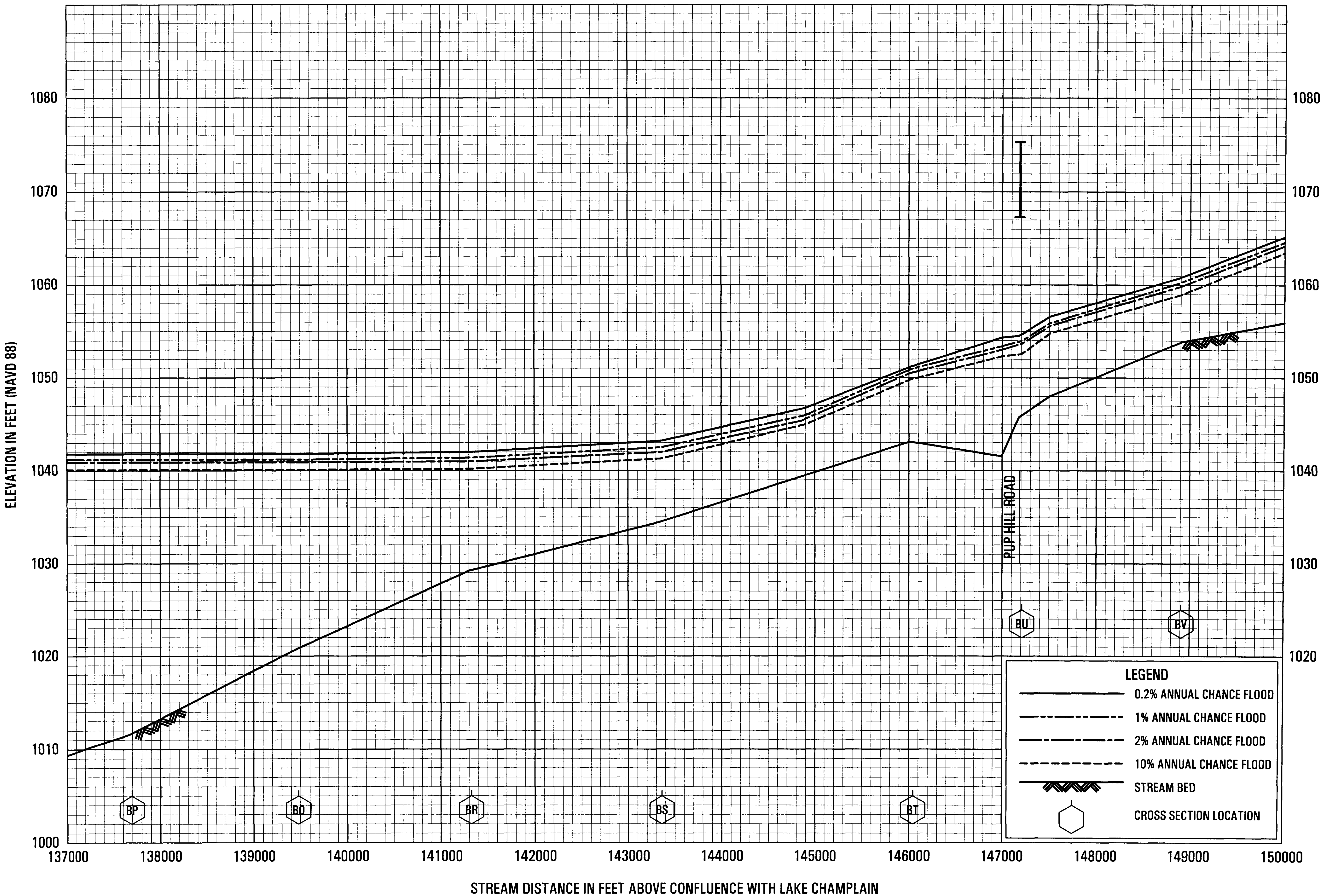
SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS

45P



FLOOD PROFILES

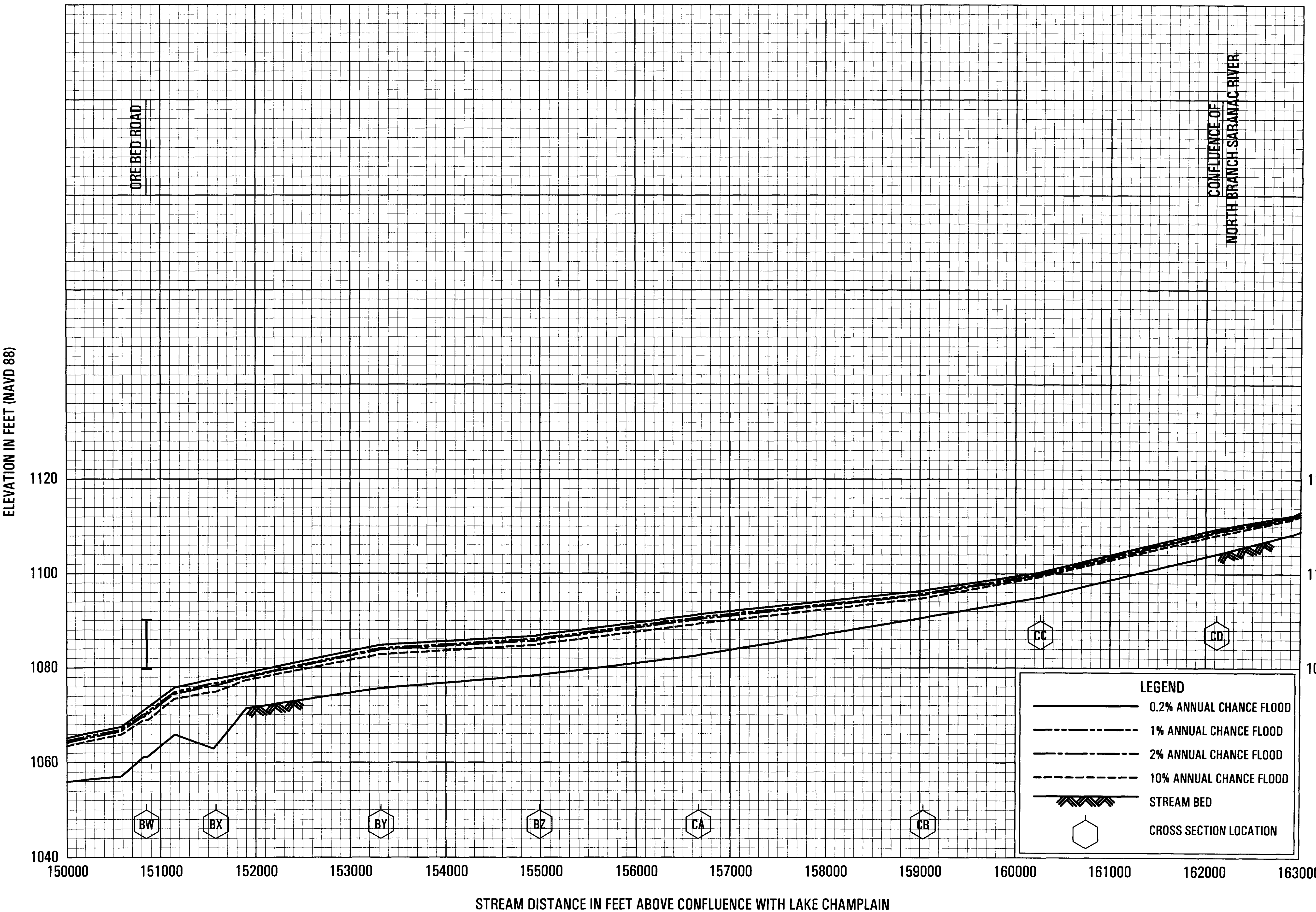
SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS

46P



FLOOD PROFILES

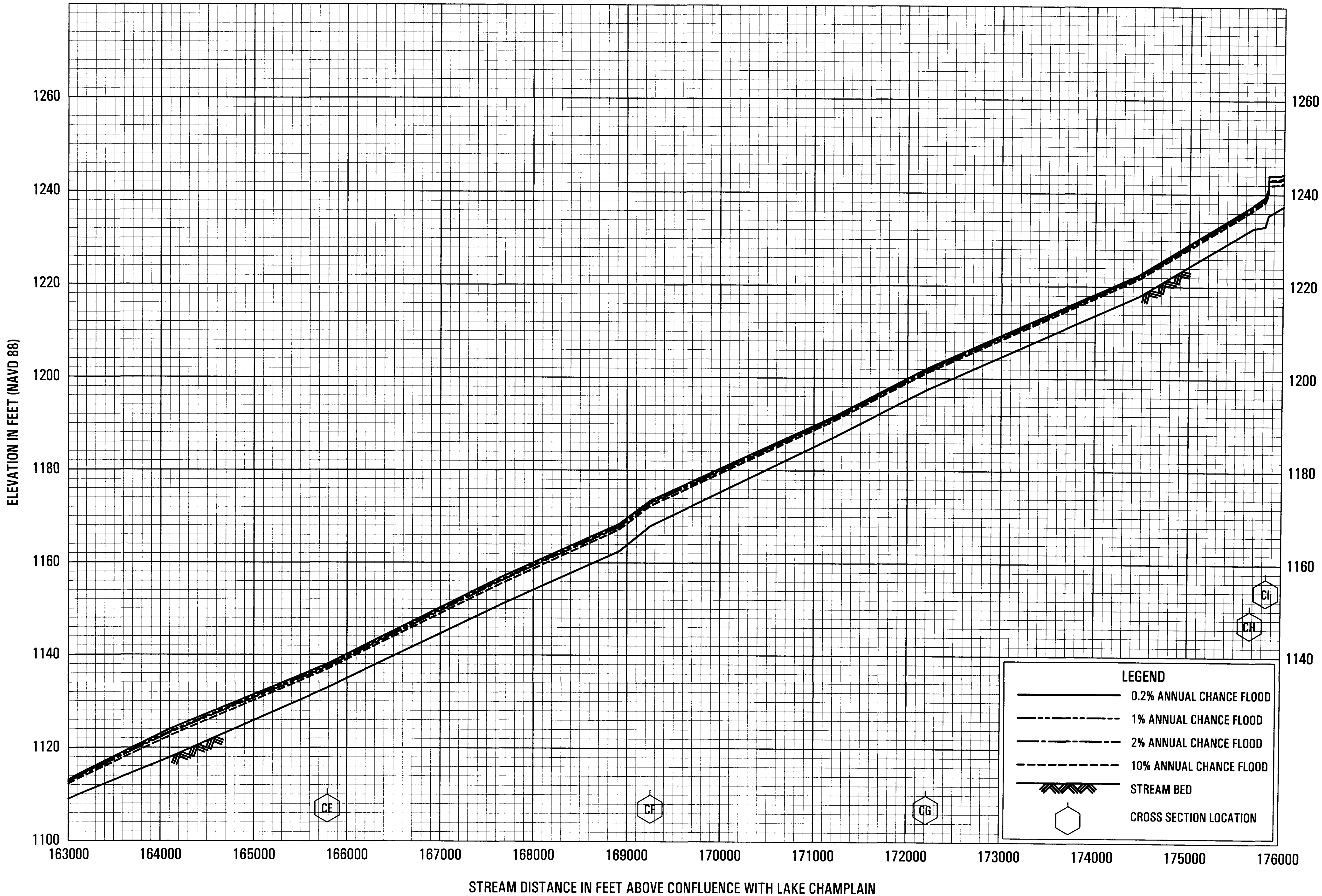
SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS

47P



FLOOD PROFILES

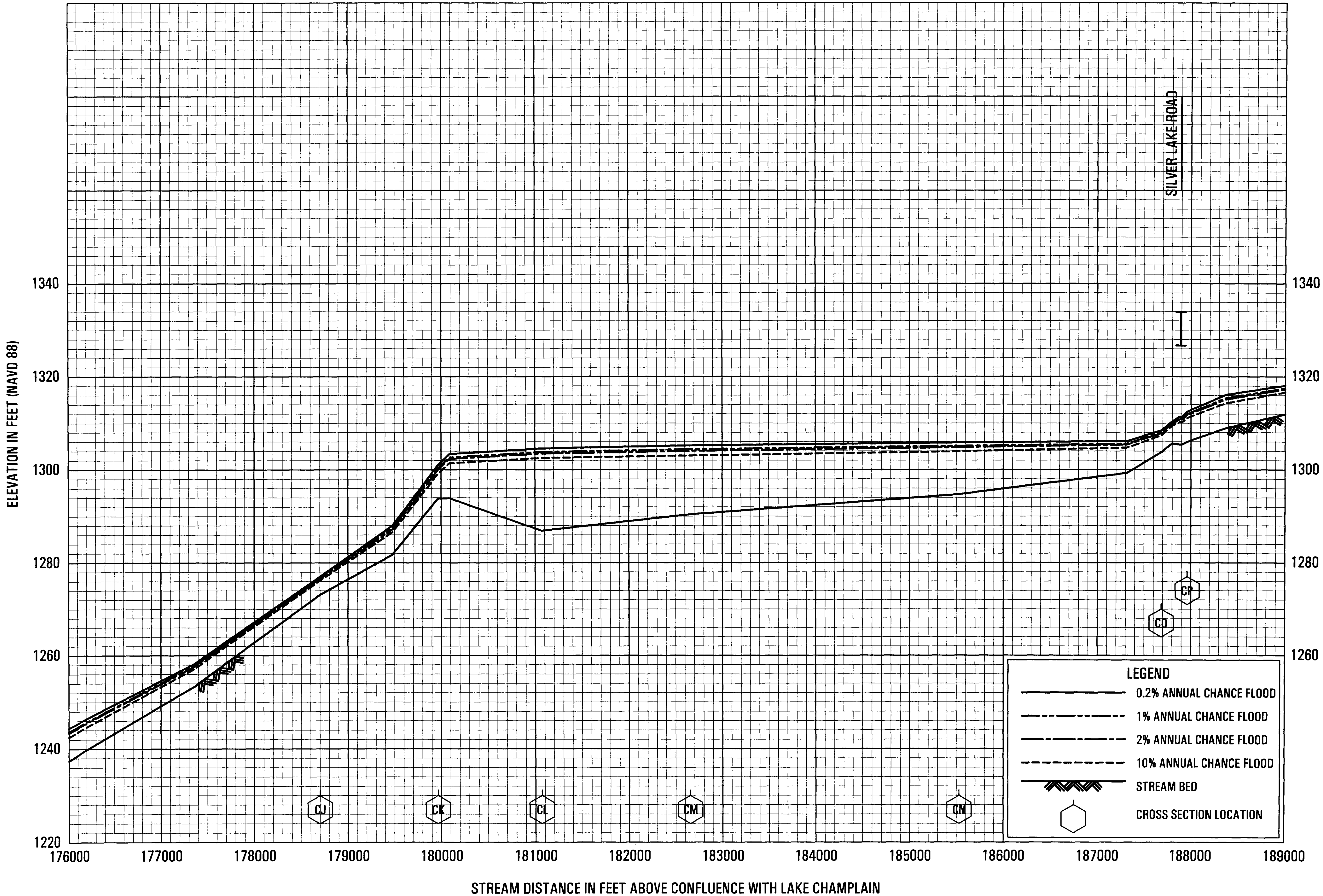
SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS

48P



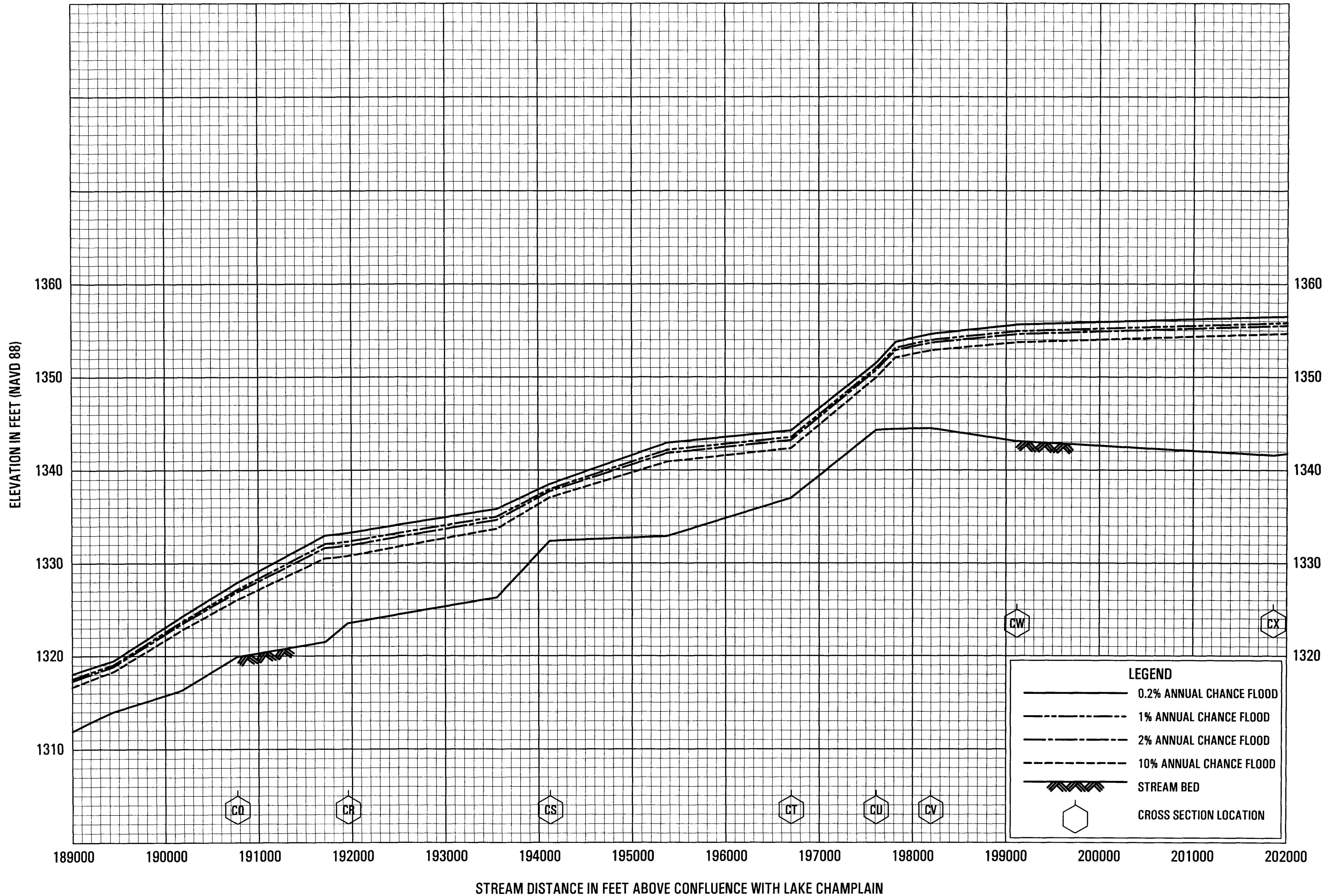
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



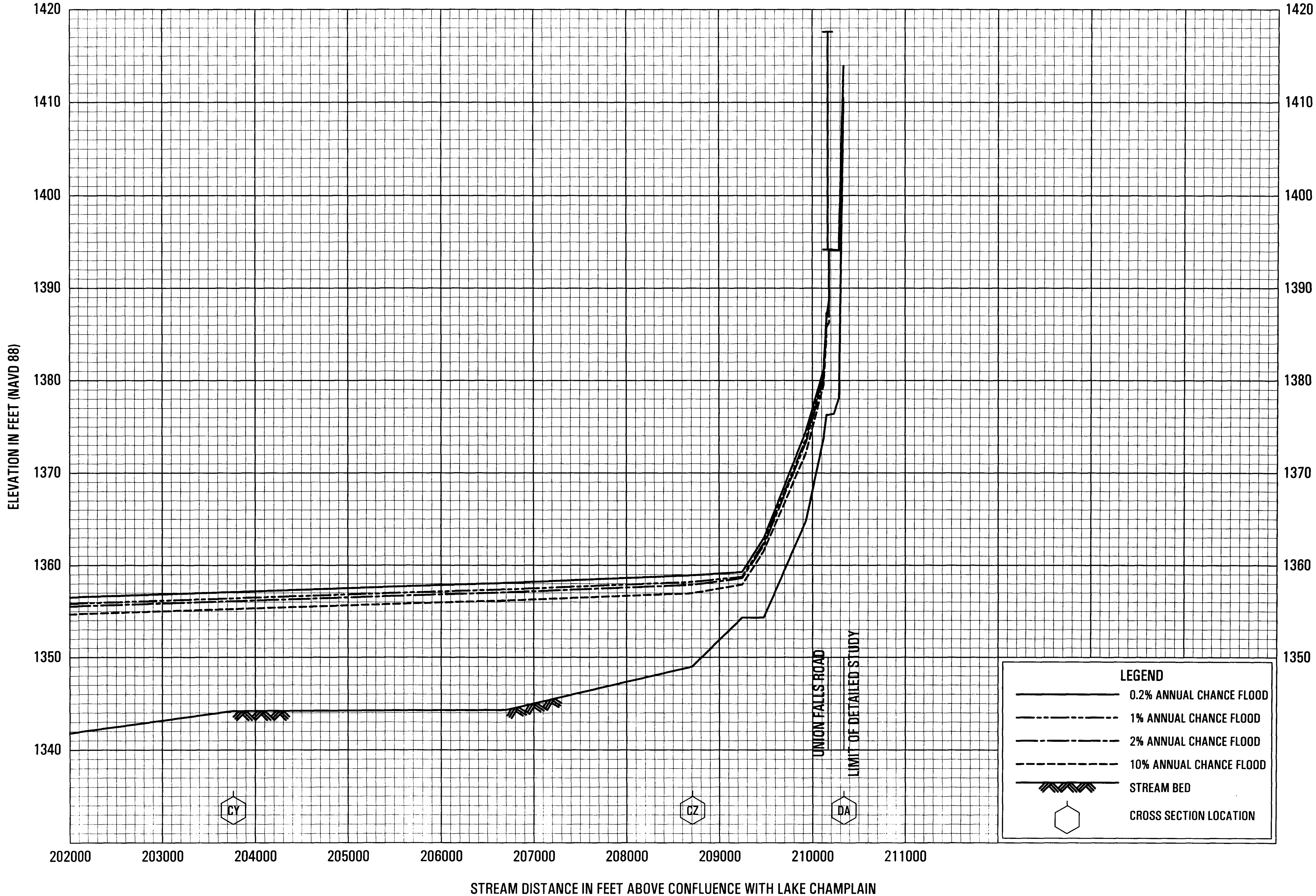
FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



FLOOD PROFILES

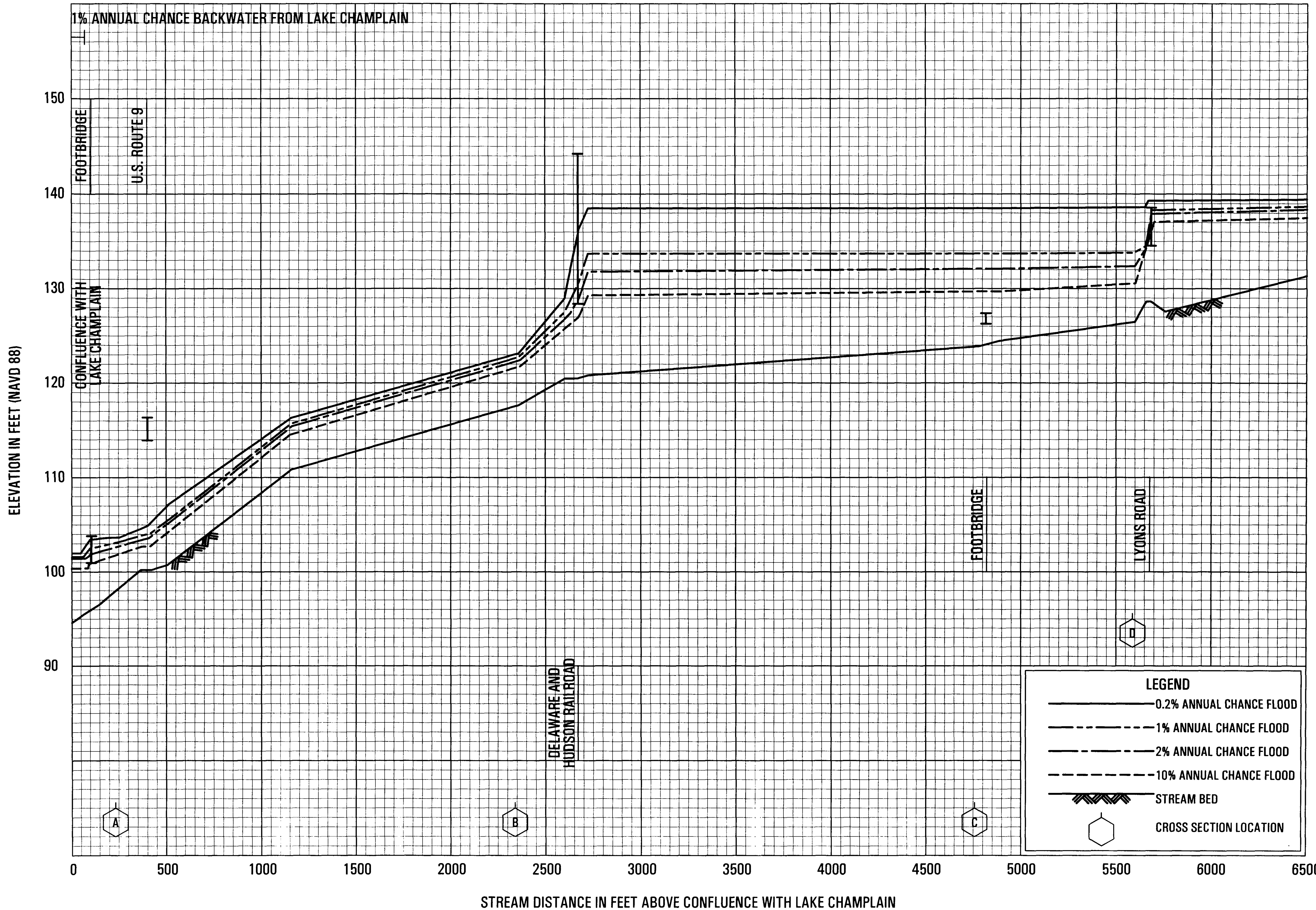
SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS

51P



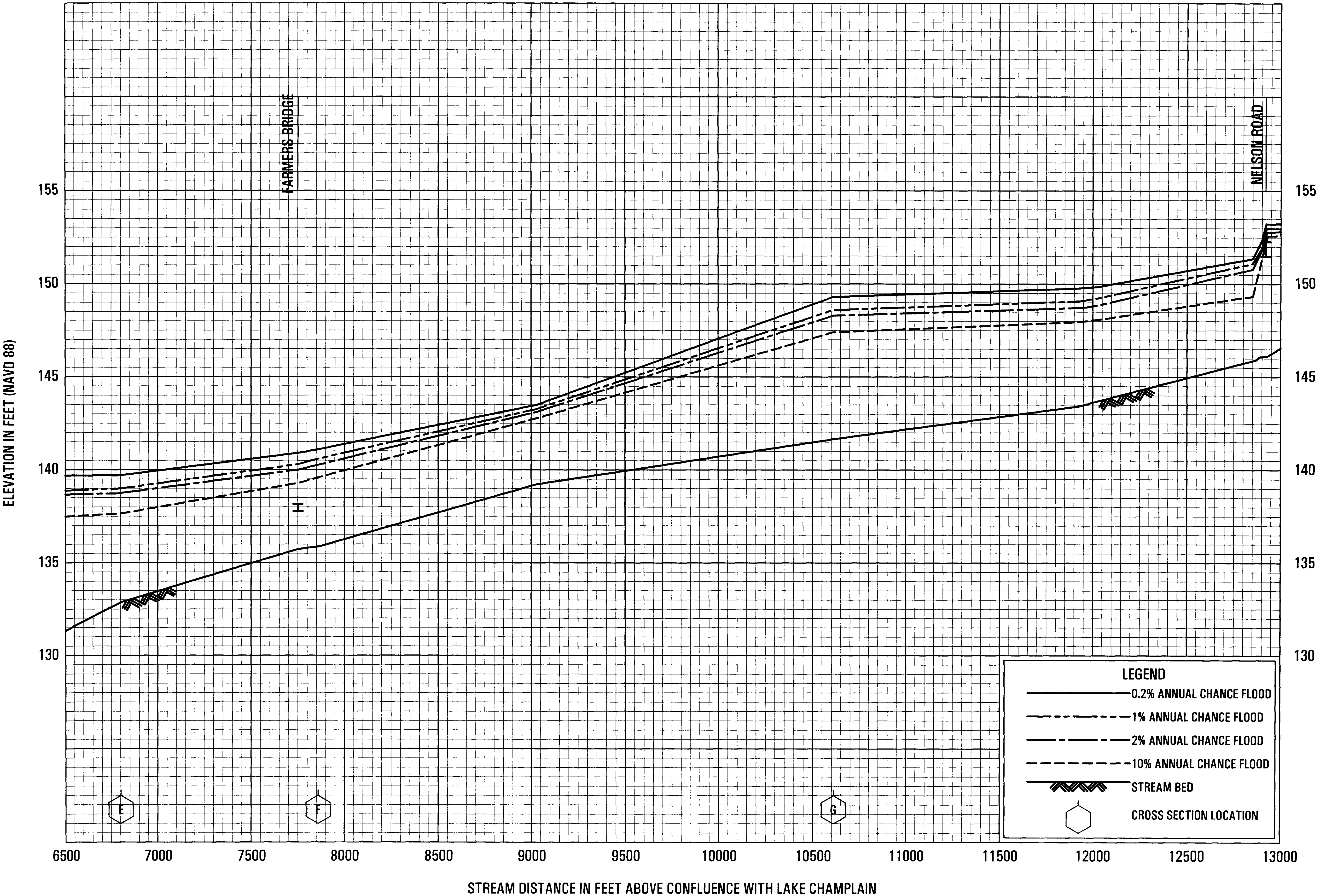
FLOOD PROFILES

SILVER STREAM

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



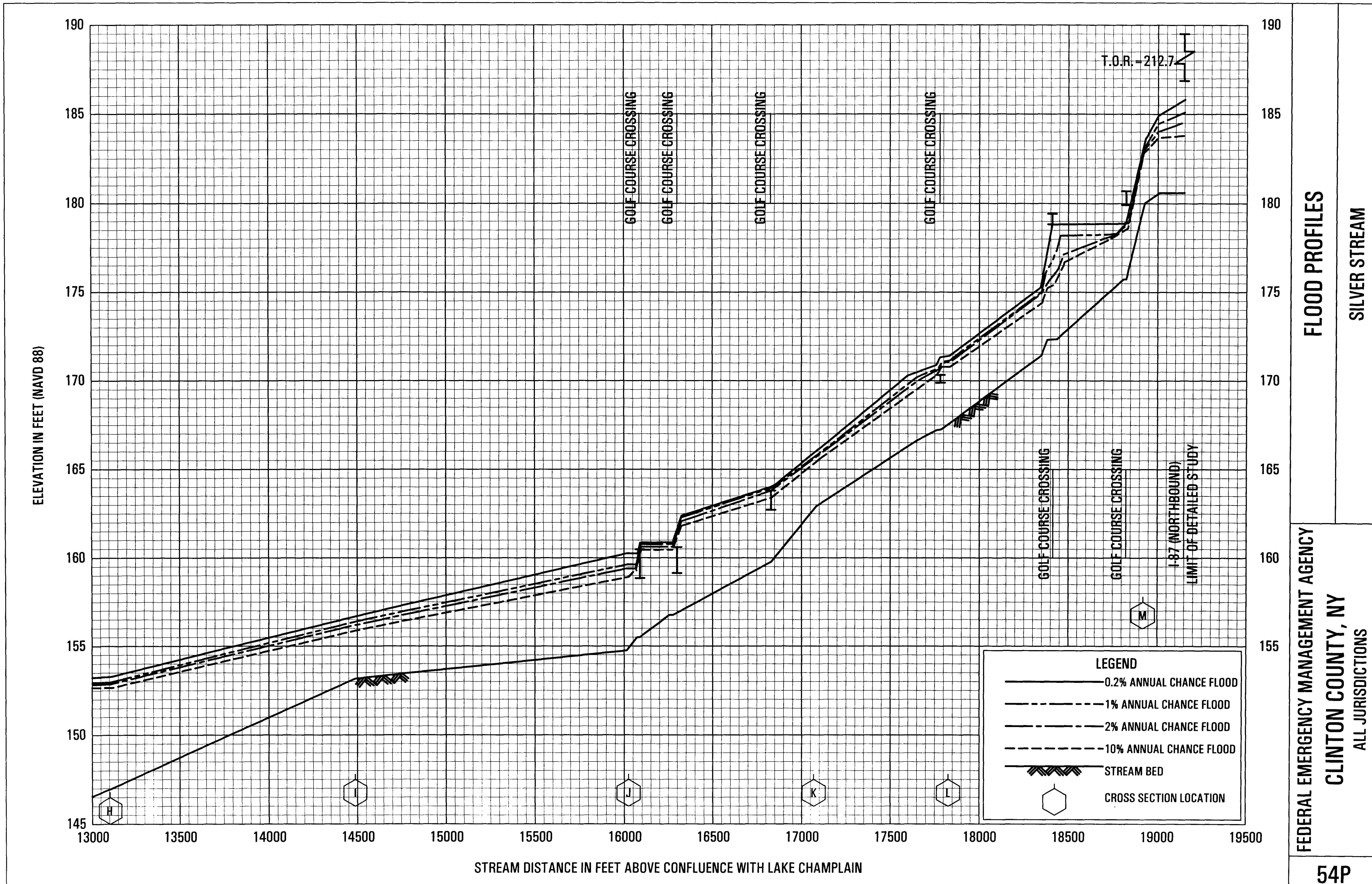
FLOOD PROFILES

SILVER STREAM

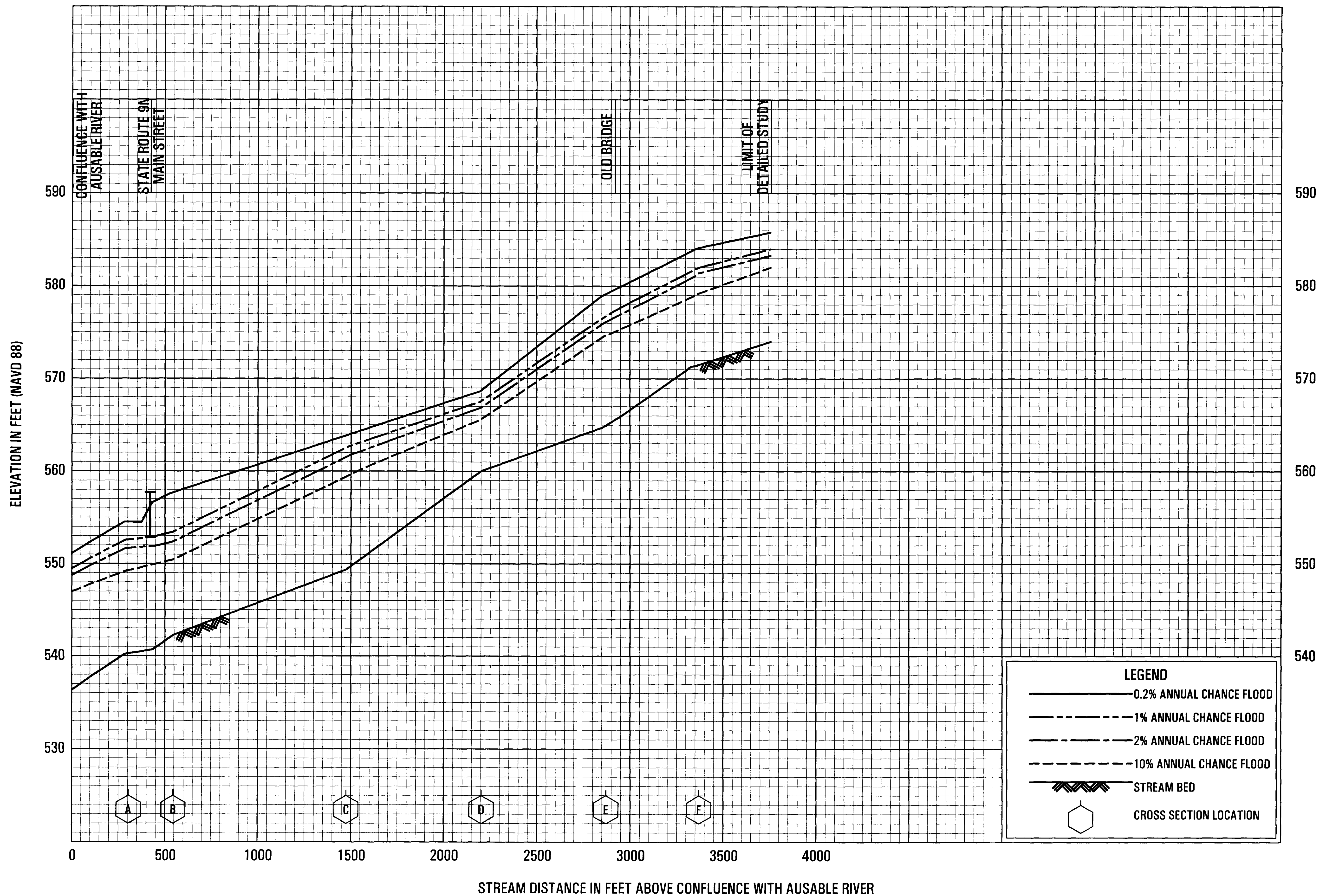
FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

ALL JURISDICTIONS



ELEVATION IN FEET (NAVD 88)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH LAKE CHAMPLAIN
190
185
180
175
170
165
160
155
150
145
13000
13500
14000
14500
15000
15500
16000
16500
17000
17500
18000
18500
19000
19500
T.O.R.=212.7
GOLF COURSE CROSSING
GOLF COURSE CROSSING
GOLF COURSE CROSSING
GOLF COURSE CROSSING
GOLF COURSE CROSSING
GOLF COURSE CROSSING
I-87 (NORTHBOUND)
LIMIT OF DETAILED STUDY
H
I
J
K
L
M
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
SILVER STREAM
FEDERAL EMERGENCY MANAGEMENT AGENCY
CLINTON COUNTY, NY
ALL JURISDICTIONS
54P



FLOOD PROFILES

WEST BRANCH AUSABLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLINTON COUNTY, NY

(ALL JURISDICTIONS)